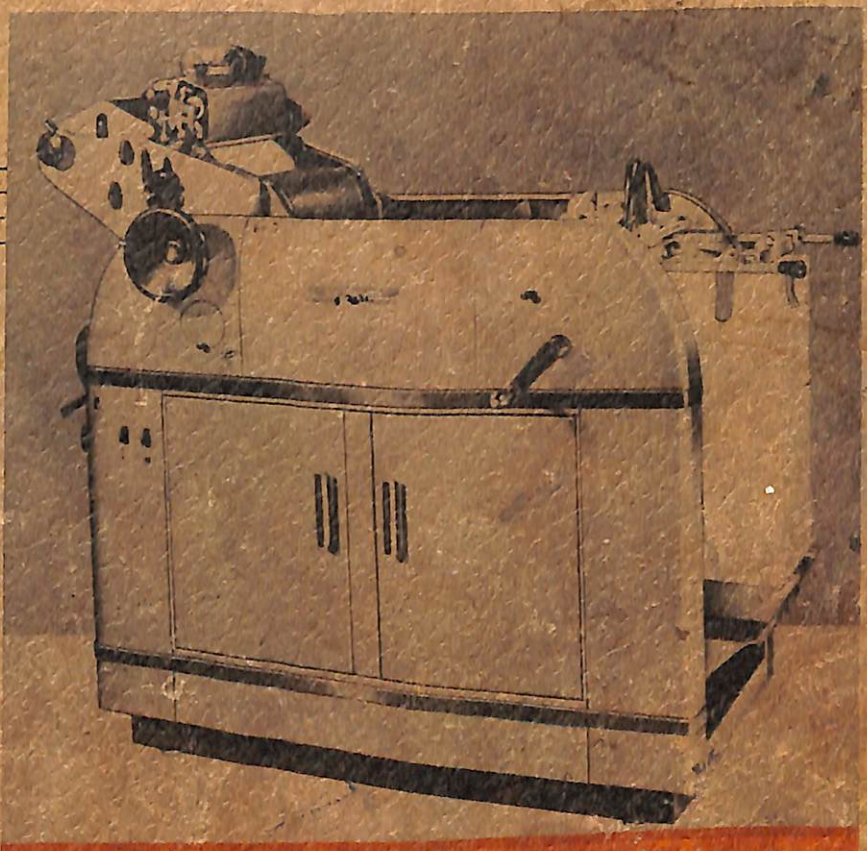


Multilith

MODEL 1250 DUPLICATOR

REFERENCE BOOK

ISA £5,99

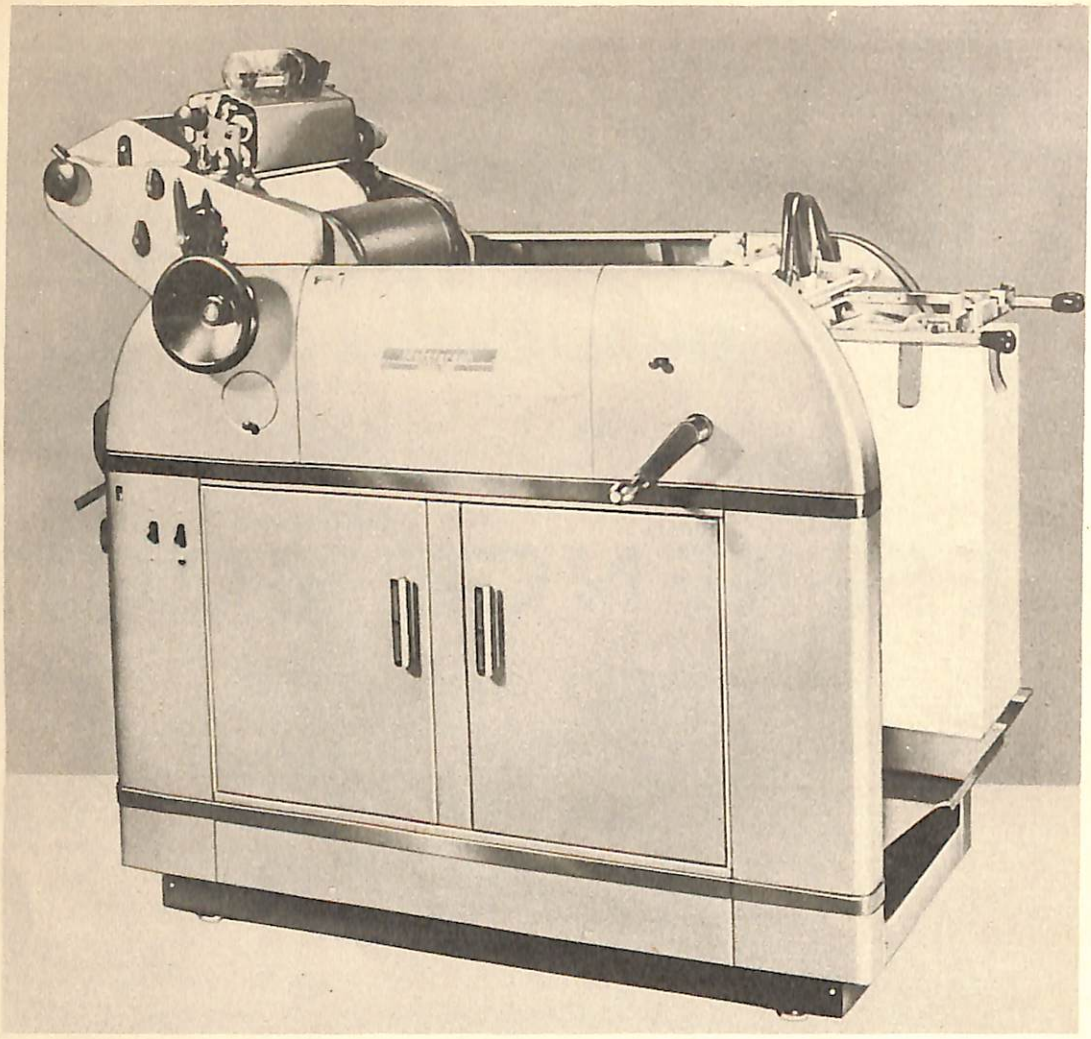
41

Multilith
REG'D.

MODEL 1250
DUPLICATOR

REFERENCE BOOK

ADDRESSOGRAPH-MULTIGRAPH LIMITED
OXGATE LANE, CRICKLEWOOD, LONDON, N.W.2



The "Multilith" Model 1250 Duplicator
and all supplies are made in England.

Duplicated in Great Britain on
"Multilith" Model 1250 Duplicator

First Edition—1950

ADDRESSOGRAPH-MULTIGRAPH LIMITED
Oxgate Lane, Cricklewood, London, N.W.2

"MULTILITH" MODEL 1250 DUPLICATOR REFERENCE BOOK

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FOREWORD

Your "MULTILITH" DUPLICATOR was purchased because it provides the convenience, versatility, and economy of the finest in office duplicating methods.

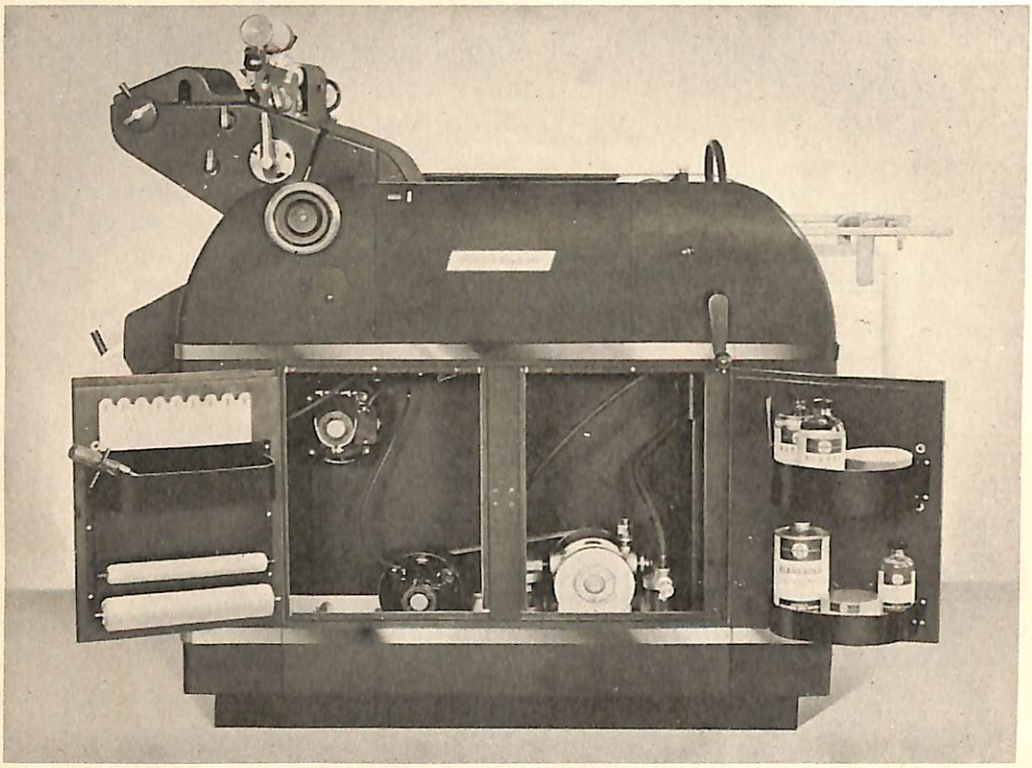
The operation of "MULTILITH" Model 1250 DUPLICATOR is based on a principle known commercially for more than a century. The recognized advantages and benefits of this superior process were not available for office use until the development and perfection of the simplified "*Multilith*" machine.

Not only will it duplicate all ordinary kinds of ink-on-paper material used in your business, but it will do much more. The exceptionally fine reproduction obtained by the "*Multilith*" machine from master copy prepared by many easy ways, makes it possible to produce a great variety of high quality material that never before could be duplicated in the office.

Back of your "MULTILITH" DUPLICATOR is more than a third of a century of research by Addressograph-Multigraph engineers—recognized leaders in office duplicating equipment and methods. The utmost care has been taken in the selection of materials, in making and in assembling the parts which make up your "MULTILITH" DUPLICATOR. With the normal amount of attention and care, your Duplicator will give you years of fine quality duplicating.

Addressograph-Multigraph Limited and your local "Multigraph" Branch want you to have the most complete satisfaction from your "MULTILITH" DUPLICATOR. It is the purpose of this book to acquaint you with the Duplicator and its operation. We suggest that you read this book carefully and keep it in the storage cabinet of the machine, handy for frequent reference.

SPECIFICATIONS



FLOOR AREA: Sub-base, 16½″ × 40″; over-all, 27½″ × 60″; operating height at conveyor board of automatic paper feeder, 35″; over-all height, 50½″.

WEIGHT: 620 pounds.

PAPER FEEDER: Automatic vacuum type; magazine holds 21″ stack . . . a capacity of 5,000 sheets of 21-lb. substance or the equivalent in other weights.

PAPER STOCK: From 13-lb. substance to 3-sheet card.

PAPER SIZES: Minimum, 3″ wide by 5″ long; maximum, 9¾″ wide by 14″ long.

DUPLICATING AREA: Maximum, 9½″ wide by 13″ long.

SPEED: Ranges from 3,000 to 6,000 impressions per hour, controlled by a variable speed mechanism.

MOTORS: Two ½-h.p. electric motors . . . one for Duplicator and one for Vacuum Pump.

DUPLICATING MEDIUMS: A choice of three . . . "DupliMAT," Aluminium and Zinc Masters.

INKING MECHANISM: Automatic 10-roller style . . . 2 form rollers, 1 oscillating roller (fixed), 3 intermediate idler rollers, 1 large oscillating roller for increased ink carrying capacity, 1 lower distribution roller (fixed), 1 ductor roller, 1 fountain roller. Removable ink fountain with 14 adjusting screws to control ink flow; 5-position ratchet to control ink.

MOISTENING MECHANISM: Automatic 4-roller style . . . 1 "Repelex" form roller; 1 rider roller; 1 ductor roller; 1 fountain roller.

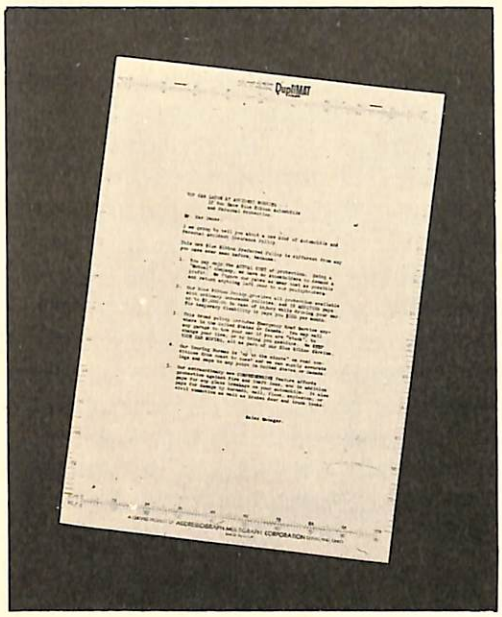
ROLLER WASH-UP DEVICE: Rubber squeegee blade and trough.

SHEET COUNTER: Automatic re-set style, counts to 99,999.

DUPLICATING MEDIUMS

The great flexibility of duplicating by the " *Multilith* " machine is shown by the fact that three *different* duplicating mediums are available on which to prepare master copy. Each kind of duplicating medium has advantages that make it particularly suitable for certain classes of work. Their large-size duplicating area frequently allows a long message to be put on one page.

" DUPLIMAT "



The Composition and characteristics of " DupliMAT " masters are entirely different from all previous " *Multilith* " duplicating mediums. They consist of high grade paper coated with a special material to withstand the lithographic process, yet are easily and readily receptive to image forming materials.

The " DupliMAT " master is ready for immediate use just as it is removed from the carton . . . no special preparation is required. Master copy is prepared on its smooth tinted surface by typing, writing, lettering, drawing, brush work, ruling, tracing . . . just as on high quality paper.

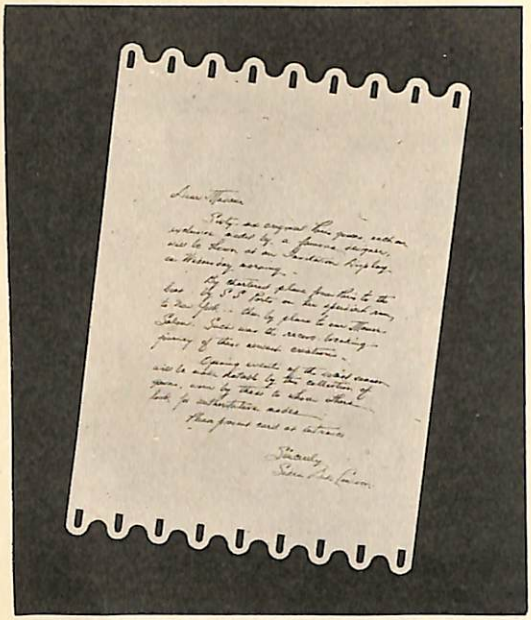
It may also be especially prepared for any of your business forms and in this instance would be known as a Preprinted " DupliMAT. " The variable information is added, either by machine or manually, and subsequently produces the completed form. Your local " Multigraph " Branch will supply you with full details of this new systems approach and process.

Erasures and corrections are easily made, also additions can be made to the master between runs. " DupliMAT " masters can be stored and re-run.

All image forming materials retain their distinctive characteristics on the finished copies.

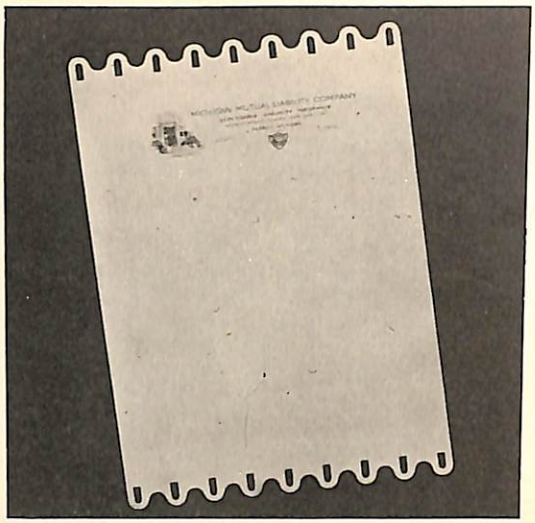
Horizontal and vertical marginal scales conforming to standard typewriter line and spacings, make it easy to locate master copy, Yellow " DupliMAT " masters are intended for duplicating up to 100 copies, and Blue "DupliMAT" masters for up to 500 copies. An instruction sheet is packed with every carton of masters and should be carefully studied to obtain all the advantages this master can offer.

ALUMINIUM MASTER



. . . a thin, metal sheet flexible enough to be placed in an ordinary typewriter. Requires no pre-use treatment. Master copy may be prepared *on* the grained surface by the various direct ways listed under " DupliMAT "masters. Errors can be erased. Images on Aluminium Masters may be protected, preserved, and filed for use at any future time. The total impression life of images on Aluminium Masters is longer than for images on " DupliMAT " Masters. The Aluminium Master is also used for Photographic images as detailed under Zinc Masters.

ZINC MASTERS



. . . an all-purpose grained metal sheet for all ways of master copy preparation . . . direct and photographic. Recommended for reproducing intricate ruled forms, complicated line drawings, and halftone illustrations. May be filed for future re-use. Your " Multigraph " Branch maintains an efficient service whereby master copy for your business forms, communications, and promotional literature such as letterheads, invoices, statements, announcements, folders, and booklets can be transferred photographically to Aluminium or Zinc Masters duplicating mediums. Photographic images on Aluminium and Zinc have the longest impression life of any " Multilith " duplicating mediums.

IMAGE-FORMING MATERIALS

For best reproduction and longest image life, direct master copy should be prepared on " Multilith " duplicating mediums with image-forming materials compounded especially for use with them.

FOR "DUPLIMAT" MASTERS

" Duro-clear " Universal Typewriter Ribbon — for all standard typewriters.

" Multilith " Carbon Paper Typewriter Ribbon No. 2021. For all typewriters equipped with paper tape feeding mechanism.

" Duro-clear " Writing Fluid. For writing, lettering, and ruling pens and brushes.

Crayon Pencil.

FOR ALUMINIUM MASTERS

" Duro-clear " Universal Typewriter Ribbon—for all standard typewriters.

"Multilith " Carbon Paper Typewriter Ribbon. For all typewriters equipped with paper tape feeding mechanism.

" Duro-clear " Writing Fluid. For writing, lettering, and ruling pens and brushes.

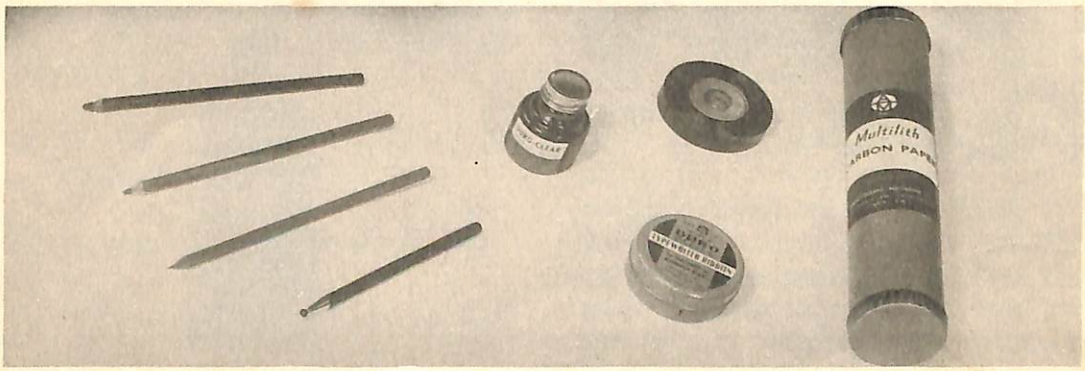
" Multilith " Carbon Paper.

Crayon Pencil.

Drawing Pencil No. 4H.

FOR ZINC

All the material listed for Aluminium can be used on Zinc to make direct image duplicating masters. In addition photographic images of your original copy can be prepared through your local " Multigraph " Branch.



"MULTILITH" SUPPLIES

AND THEIR USE

Many years of laboratory research and development have been devoted to perfecting the group of solutions which are an inherent part of the unique, high-quality "*Multilith*" office duplicating. For your protection, they are sold under registered trade-marks. Used exclusively, these solutions enable office workers to obtain simplified, trouble-free, low-cost, performance from the new "Multilith" Model 1250 Duplicator.

"PLATEX"

"*Platex*" is a special solution indispensable in the operation of the "Multilith" duplicator. It has a strong affinity for metal and a repellent action toward greasy substances. When applied to the surface of a "Multilith" duplicating medium, "*Platex*" temporarily prevents ink adhering to the areas without an image.

"*Platex*" is of two kinds—~~BROWN~~ for use on Aluminium Masters (direct image) and GREEN for use on "DupliMAT", Aluminium (photographic image) and Zinc Masters. "*Platex*" should be applied to "Multilith" Masters just before they are used on the "Multilith" Duplicator and in no case should it be allowed to dry on the master.

HOW TO APPLY . . .

Make certain duplicating medium is dry. Pour a small quantity on a tuft of cotton wool and rub lightly over the entire surface of duplicating medium. Do not use an excessive quantity — just enough to thoroughly moisten the surface.

"REPELEX"

"*Repelex*" is an operating solution compounded especially for use with "Multilith" duplicating mediums and inks. It carries on the action started by the initial coating of "*Platex*" on a duplicating medium. "*Repelex*" has the properties of wetting and clinging strongly to the surface of duplicating mediums, and at the same time repelling the ink from the rollers and being repelled by the ink on the image.

HOW TO MIX . . .

"*Repelex*" is a concentrated solution and must be diluted before

using. ALWAYS USE DISTILLED WATER WHEN MIXING. For ML and AML series inks—1 ounce of concentrated "*Repelex*" to 7 ounces of distilled water. (Complete directions are on the container label.)

HOW TO USE . . .

Refer to instructions under "Filling Repelex Fountain."

"KEEPEZE"

"*Keepeze*" is a solution used to protect Aluminium and Zinc duplicating masters which are to be stored for future use. It prevents oxidation on the non-image areas.

WHEN TO USE . . .

Aluminium and Zinc masters must be protected with a coating of "*Keepeze*" for the following operating conditions :

(1) If the Duplicator is to be stopped for a period.

(2) At the end of each day's run.

(3) If the masters are to be stored.

HOW TO APPLY . . .

For operating conditions (1) and (2) above, Aluminium and Zinc masters can be protected with "*Keepeze*" without removing them from the Duplicator. Saturate a water-dampened tuft of cotton-wool with "*Keepeze*." Using light strokes go over the entire surface of the master until a film of "*Keepeze*" is spread evenly and thoroughly. Then rub lightly with a piece of clean cheese cloth to remove excess "*Keepeze*" from the image.

For operating condition (3) above, on Aluminium and Zinc masters, the master should be removed from the Duplicator, and washed thoroughly with a water-soaked tuft of cotton-wool, preferably under running water. When the master is thoroughly clean, dry it with a "Multilith" hot air drier.

After master is thoroughly dry, apply a coating of "*Keepeze*." Pour in the centre of the master a spot of "*Keepeze*" about the size of a half-crown. With a clean sponge or a tuft of cotton-wool free from grit, spread the "*Keepeze*" over the entire surface of the master, using horizontal and vertical strokes and rubbing lightly until the "*Keepeze*" is spread evenly and thoroughly. Then rub lightly with a piece of clean cheese cloth to remove excess "*Keepeze*" from image.

Before storing the master, the image should be preserved with a coating of "*Sealinx*." (See "How to Apply Sealinx.")

"SEALINX"

"*Sealinx*" is a solution used on Aluminium and Zinc masters to build up weak images and to strengthen and preserve images which are to be stored for future use.

WHEN TO USE . . .

"*Sealinx*" should be used on Aluminium and Zinc masters under the following operating conditions:

(1) As a precautionary measure to strengthen direct and photographic images during a run *before* signs of weakening appear.

(2) To preserve direct and photographic images which are to be stored for future use.

HOW TO APPLY . . .

For operating condition (1) above, make certain the master is well moistened with a fresh coating of "*Repelex*" solution from the fountain. Pour a few drops of "*Sealinx*" on a small tuft of clean, dry cotton-wool and spread evenly over every part of the image. With a clean tuft of cotton-wool moistened with "*Repelex*" solution from the fountain, go over the entire surface of the master to remove excess "*Sealinx*." Resume normal operation.

For operating condition (2) on Aluminium and Zinc Masters. "*Keepeze*" *must be applied before* "*Sealinx*". Carefully apply a coating of "*Keepeze*" as previously instructed. Pour a small quantity of "*Sealinx*" (about the size of a half-crown) in the centre of the master. With a small tuft of clean, dry cotton-wool spread the "*Sealinx*" evenly and thoroughly over the entire master. With a second piece of clean, dry cotton-wool, rub the "*Sealinx*" (using horizontal and vertical strokes) until it is thoroughly dry. The master is now in proper condition for safe storage.

CAUTION — When applying "*Sealinx*" to an Aluminium or Zinc master, be sure to apply a uniform coating of "*Keepeze*" *first*. Make certain you have left no spots on the master unprotected by "*Keepeze*," otherwise it will be impossible to remove the "*Sealinx*" from the master when it is desired to re-run the image.

NEVER ATTEMPT TO STORE A "MULTILITH" MASTER FOR FUTURE

USE WITHOUT PROPERLY APPLYING COATINGS OF " KEEPEZE " AND " SEALINX " AS INSTRUCTED ABOVE.

TO REMOVE " KEEPEZE "— " SEALINX " . . .

Wash off the master with a tuft of water - soaked cotton - wool (under running water if possible) until " *Keepeze* " and " *Sealinx* " are completely removed. Turn the cotton-wool frequently to a clean portion. Then force-dry thoroughly with hot air drier.

" MULTILITH " PRESERVATIVE SOLUTION

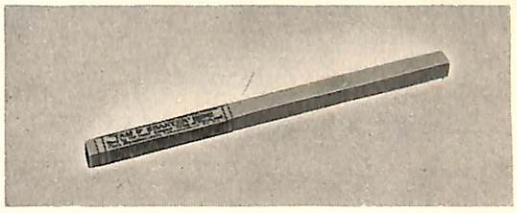
Preservative Solution prevents or limits image spread during storage of the " DupliMAT " master and also helps to remove the minute specks of ink or dirt that may have adhered to the surface. If Preservative Solution is not used, these minute specks, which may not be visible to the eye, will dry, forming an image that will reproduce when the " DupliMAT " is re-run.

When the run is completed, turn the ink and " *Repelex* " form rollers to the " off " position. With the " DupliMAT " and Blanket in contact, and paper feeding through the duplicator, " run down " the " DupliMAT " until almost all ink has been removed from the image. " Run down " should be about fifteen sheets, most of which can be used. Remove the " DupliMAT " from the cylinder, place on a flat surface, image side up, and immediately apply Preservative Solution. Dampen a clean pad of cotton-wool with Preservative, and squeeze all excess solution from the pad. Apply the solution to the entire surface of the " DupliMAT " and immediately go over the surface with a clean, dry cotton pad. Rub lightly with the dry pad so that the image will not be smeared.

Use as little Preservative Solution as possible. Do not allow any excess solution to dry on master. If any excess solution does dry on the master, additional images may not adhere, or pick up ink properly.

It is unnecessary to remove " Multilith " Preservative Solution from the master before re-use. The " DupliMAT " should be treated in the same way as a new master.

SCOTCH HONE



Scotch Hone is a very fine grade of stone used to remove spots from non-image areas of Aluminium and Zinc duplicating masters. Always moisten the master with "*Repelex*" solution before honing. After honing, rub honed areas thoroughly with " *Platex*."

"MULTILITH" INKS

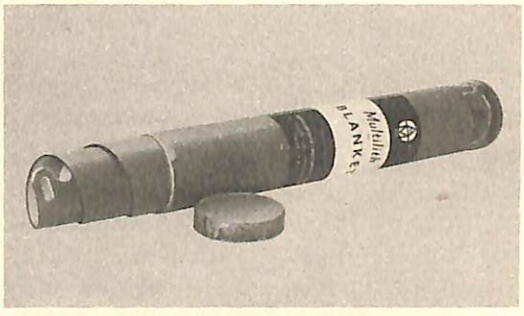
" Multilith " inks are a definite part of " Multilith " office duplicating. They are compounded from carefully selected and tested ingredients which conform to the operating requirements of the machine. Their exclusive use ensures highest quality duplicating, other factors being correct.

" Multilith " inks are furnished in two grades. Grade " A " is recommended where duplicating is a combination of type text matter, ruled forms, halftone illustrations, and areas of solid colour. Grade " B " is suitable for bulletin and general purpose matter. Your local " Multigraph " Branch can supply a separate catalogue of " Multilith " Inks.

BLANKET WASH

Blanket Wash is an economical ink-solvent and cleaning solution prepared especially for use in " Multilith " duplicating departments. It is an all-purpose cleaner recommended for all rubber parts —inking rollers, blankets, paper feeder rollers. It should *always* be used when cleaning the inking mechanism with the Wash-up Device on " Multilith " Model 1250 Duplicator.

"MULTILITH" BLANKETS

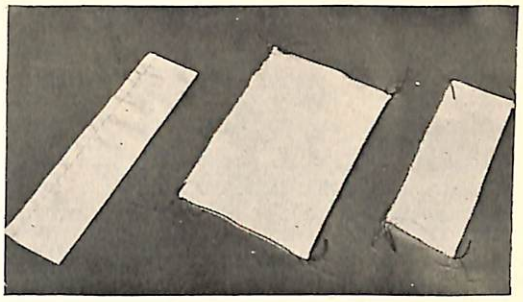


A laminated rubber blanket is one of the essential elements of " Multilith " office duplicating. It serves as the intermediary between the duplicating master (" Dupli-MAT " Aluminium or Zinc Master) and the paper, picking up a thin film of ink from the image and transferring it to the surface of the paper. " Multilith " rubber blankets assure high quality duplicating because they are of correct, uniform thickness . . . have a smooth, non-porous, resilient surface . . . will not stretch or distort . . . will resist action of inks, solutions, and cleaners.

"BLANKDUST"

"*Blankdust*" is a powder used on "Multilith" blankets to recondition the rubber surface and to overcome tackiness and swelling. It tends to counteract residual ink and to draw solutions and cleaners from the pores of the rubber, accumulated during the day's operation. It should be dusted on the blanket after cleaning with *Blanket Wash* at the end of a day's run. Its regular use will prolong the life of blankets.

"REPELEX" COVERS



To assure even and positive distribution of "*Repelex*" solution over the entire surface of the duplicating master, cloth-covered rollers are used—molleton cloth for the ductor and form rollers; linen cloth for the cleaner roller. Molleton cloth "*Repelex*" covers possess many superior qualities. The molleton cloth is exceptionally uniform in texture with firm, tough body for extra strength. The surface is especially smooth with close packed nap which minimizes linting. The special diagonal weave tends to prevent toning streaks.

PREPARING MASTER COPY

You have a wide choice of *different* ways, each easy to use, to quickly prepare master copy for rapid reproduction on the "MULTILITH" Model 1250 DUPLICATOR. Depending upon the effect desired, you can use *typewriter*, *writing pen*, *lettering pen*, *ruling pen*, *brush*, *crayon*, *carbon paper*, *tracing*, and *photography*.

Each of these ways will be discussed separately as they are used on " DupliMAT " Aluminium or Zinc Masters duplicating mediums.

MASTER COPY ON "DUPLIMAT"

LOCATING IMAGE . . .

At top and bottom of the " DupliMAT " are marginal spacing scales graduated for Pica and Elite typewriter character spacing. Down each side are similar scales graduated for typewriter line spacing.

In order to determine the location of image on the " DupliMAT," it is necessary to know where the impression is wanted on finished copy.

Place a sheet of paper the size to be run ($6\frac{1}{2}$" or more in width) on the " DupliMAT " so that the top edge is in line with the first graduation on the line spacing scale, centring the sheet from side to side. Mark the desired horizontal and vertical margins on the corresponding scales of the " DupliMAT " (illustration No. 1). If the " DupliMAT " is to be typed or written, the guide marks need only indicate the position of the first character in the first line. If the image is to be drawn, light pencil guide lines, which will not reproduce, can be made.

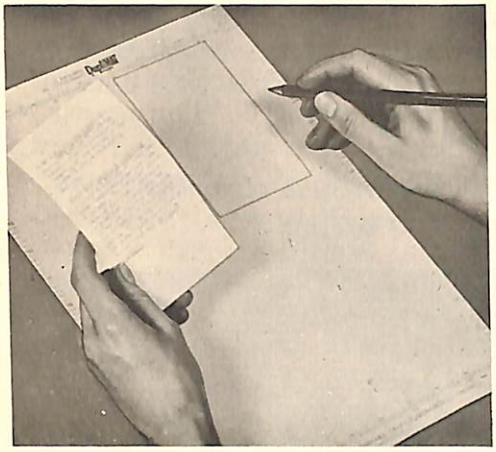
1—Locating Image on " DupliMAT " for letterhead-size Sheet

The above instructions apply in all cases except:

(a) When it is desired to place 13 inches of copy on a 14-inch sheet, start the first line of typing opposite the second line space graduation.

(b) When paper less than $6\frac{1}{2}$" wide is to be used, place a sheet of stock on the " DupliMAT " with the top edge of the sheet in line with first graduation on line spacing scale, and the right edge in line with the 82nd graduation on the Pica character spacing scale. Then trace lightly around the sides of the stock with an ordinary lead pencil

(Illustration No. 2). Confine the copy to the area inside these lines.



2—Locating Image on " DupliMAT " for 3" by 5" Sheet

Locating image in this manner assures that paper stock will strike the feeler finger which controls the impression cylinder release and as many paper stop fingers and paper gripper fingers as possible. This procedure is absolutely necessary when using minimum size stock, 3" × 5" with the 3" dimension the lead edge.

This method is to be followed for cards to be fed the long way and the typed image lines run the short way of the card. If it is desired to run the typed image lines the long way of the card, and a wide-carriage typewriter is not available so that a " DupliMAT " can be inserted sidewise, then it is suggested that you use double-size card stock and type two images, one below the other, on a standard typewriter. These cards can be cut apart after running. (Illustration No. 3.)

3—Locating Image on " DupliMAT " for Double Cards

TYPING . . .

4—Typing on " DupliMAT "

Any standard typewriter may be used. The better the mechanical condition, the finer the reproduction. Be sure the type bars are thoroughly clean.

Notice that the " DupliMAT " has two different surfaces; the face is coloured either yellow or blue and the reverse is white. Images must be placed on the coloured surface which carries the marginal spacing scales—not on the white paper back.

If you wish to duplicate messages to simulate typewriting, place

on your typewriter a " Duro-clear " Universal typewriter ribbon (fabric). This ribbon can be obtained from your Multigraph Branch . . . spooled to fit standard typewriters.

If you wish your duplicated messages to simulate printing, with character impressions sharp and clear-cut (or if your typewriter is fitted with a printface of type) place on your typewriter a " Multilith " *carbon paper* typewriter ribbon. This ribbon can be obtained from your "Multigraph" Branch in the correct degree of hardness for highest quality work. Paper tape ribbons should be used only on typewriters equipped with a special paper tape feeding mechanism which advances the tape a full space after each key stroke.

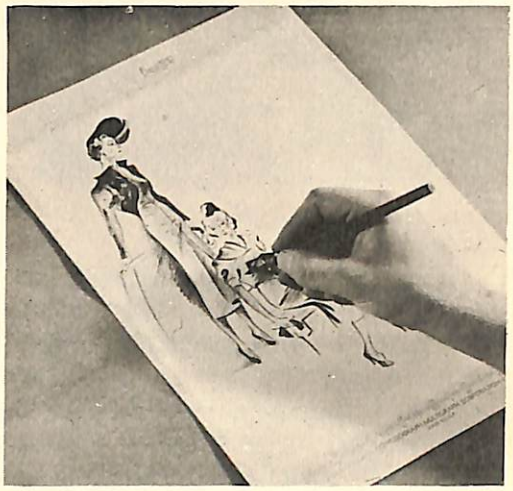
For best typing on " DupliMAT " Masters, use same stroke as when typing on ordinary paper. Make certain every character is perfectly formed. Before advancing carriage to next line, it is well to glance back along a line of typing and if any character is weak, strike over lightly.

INK WORK . . .

5—Writing on " DupliMAT "

For writing, lettering, drawing, and ruling, use " Duro-clear " Writing Fluid. A draughtsman's ruling pen may be used to lay out business forms. A brush may be used to lay broad strokes and for filling in solid areas. "Duro-clear" Writing Fluid is used just as you would use ink on ordinary paper.

CRAYON WORK . . .



6—Drawing on " DupliMAT "

For writing, lettering, and drawing (when gradation in shading is desired) use Crayon Pencil. Press just hard enough to show the degree of shading desired — the reproduction will be identical with the master copy.

TRACING . . .

The " DupliMAT " is translucent. This feature makes it ideal for shadow tracing from original sketches, drawings, and ruled forms. The original copy is always placed *under* the " DupliMAT." The image can be traced with Crayon and copies immediately duplicated. The image can also be traced lightly with an ordinary drawing pencil and this outline

redrawn and shaded with " Duroclear " Writing Fluid and Crayon.

Tracing can be greatly facilitated by placing the original and copy on a " light box."

CORRECTIONS . . .

The Rubkleen Eraser No. 6002, obtained from your local " Multigraph " Branch, should always be used to make clean, undetectable erasures in either typed or drawn images.

In making an erasure, a few strokes of the eraser are ordinarily sufficient to remove the error. Turn the eraser after each stroke. It is necessary only to rub off the surface colour of typed matter—not to completely erase all traces of the image. The correction is then retyped over the same spot. The eraser should be cleaned by rubbing on clean paper or cloth after each stroke to prevent rubbing the ink into the surface of the " DupliMat."

Do not erase too deeply, just remove the surface of the image forming material.

In making a correction in typed matter it is best to make the correction immediately rather than after typing several more lines. If you attempt to back up the typed " DupliMAT " in the typewriter, the paper feed rollers will pick up the wet image and transfer it to the " DupliMAT."

Should it be necessary to reinsert a typed " DupliMAT " into the typewriter, the typed image should be protected by a clean sheet of paper. The paper can then be torn off at the point where the correction is to be made. If any character becomes smeared, the entire word should be erased and retyped. Avoid touching typed matter at all times.

" DupliMAT " Masters can be used within a short period of being prepared, but best results are obtained if the image is allowed to settle for one hour.

MASTER COPY ON ALUMINIUM (DIRECT IMAGE)

LOCATING IMAGE . . .

Instructions for locating images on Aluminium duplicating mediums are the same as for " DupliMAT " Masters. Refer to them under the heading " Master Copy on ' DupliMAT '."

7—Locating Image on Aluminium with " DupliMAT " Scale

Use the character spacing scale, cut from the top of a " DupliMAT " at the second line spacing scale graduation, to facilitate locating side margins of images to be

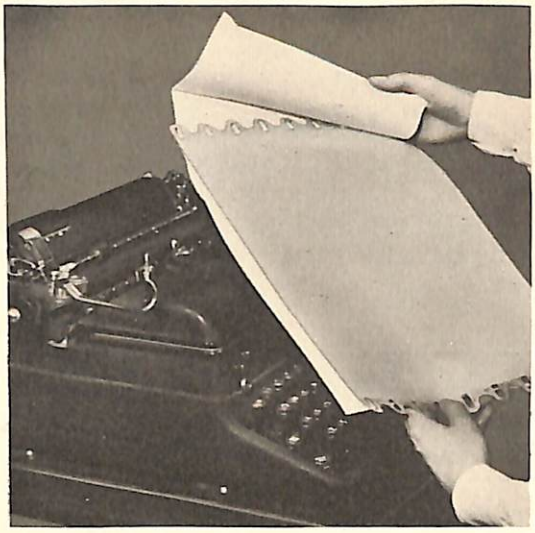
duplicated on paper stock less than $6\frac{1}{2}''$ wide. First line of typing must be at least $1\frac{1}{8}''$ from top of the Aluminium Master measuring from extreme end of loops. (See Illustration No. 7).

The Aluminium Master is purposely made to be extremely sensitive to the various image-forming materials. Even ordinary lead pencil lines will pick up ink and reproduce. When necessary to make guide lines on Aluminium Masters always use a non-reproducing pencil. Fingermarks may reproduce. Handle the Aluminium Masters by the loops whenever possible. When applying direct images by writing, lettering, or drawing, the area not being worked on should be protected with a sheet of paper.

TYPING . . .

For best results, the typewriter used for typing on Aluminium Masters should be adjusted so that the typebars strike the surface evenly and squarely. The tension on certain key bars should be increased so the characters will not emboss the metal. This is true of punctuation marks and thin characters such as f, i, j, l, and t. Be sure the type bars are thoroughly clean.

To facilitate inserting an Aluminium Master in the typewriter, fold a sheet of paper over the top end to prevent the loops catching in the paper feed roller mechanism. When the Master is in position for typing, this paper can be removed by temporarily releasing the tension on the paper feed rollers and pulling out the sheet. (See Illustration No. 8.).



8—Placing Aluminium Master in Typewriter with Shield

If you wish to duplicate messages to simulate typewriting, place on your typewriter a " Duro-clear " Universal Typewriter ribbon (fabric). These ribbons can be obtained from your "Multigraph" Branch, spooled to fit all standard typewriters.

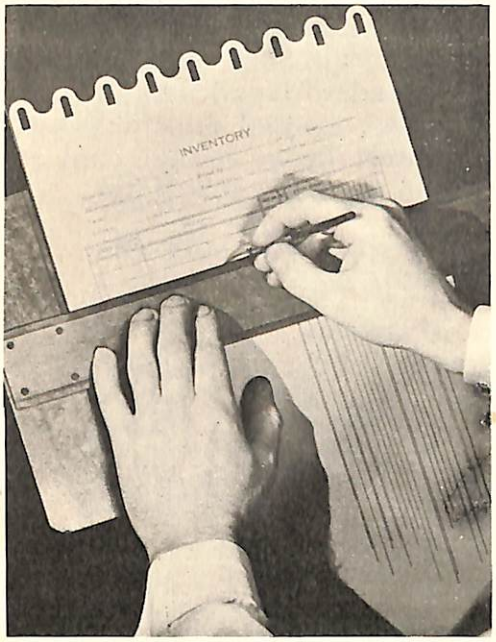
If you wish your duplicated messages to simulate printing, with character impressions sharp and clear-cut (or if your typewriter is fitted with a print-face of type), place on your typewriter a " Multilith " *carbon paper* typewriter ribbon. This ribbon can also be obtained from your " Multigraph " Branch in the correct degree of hardness for highest quality work. Paper tape ribbons should be used only on typewriters equipped with a special paper tape

feeding mechanism which advances the tape a full space after each key stroke.

For best typing on Aluminium use a slightly lighter touch than on " DupliMAT " Masters. This is to avoid embossing the characters into the metal. Make certain every character is perfectly formed. Before advancing carriage to next line, it is well to glance back along a line of typing and if any character is weak, strike over lightly.

INK WORK . . .

For writing, lettering, drawing, and ruling, use " Duro-clear " Writing Fluid. A draughtsman's ruling pen may be used to lay out



9—Ruling on Aluminium

business forms. A brush may be used to lay broad strokes and for filling in solid areas. " Duro-clear " Writing Fluid is used just as you would use ordinary ink on paper.

CRAYON WORK . . .

For writing, lettering, and drawing (when gradation in shading is desired) use a crayon pencil. Press just hard enough to show the degree of shading desired—the reproduction will show the same gradations of tone.

TRACING . . .

For tracing through original sketches, drawings, and ruled forms, a sheet of " Multilith " Carbon Paper is used. The carbon paper, laid on the Aluminium Master with the original design

10—Tracing on Aluminium

placed on top, is held in position with Scotch tape at the upper corners. Lines are traced with a stylus or sharp-pointed hard pencil. Copies can be duplicated immediately from this traced image, the lines showing up quite fine. The lines of the image can be strengthened with " Duro-clear " Writing Fluid or Crayon and shading added.

CORRECTIONS . . .

Rubkleen Eraser No. 6002, obtainable from your " Multigraph " Branch, should always be used to make clean, undetectable erasures in direct image master copy.

In making an erasure, horizontal strokes followed by vertical strokes should be used wherever possible. This motion tends to " regrain " the Aluminium at the spot where correction is to be made. Only a few strokes of the Eraser are necessary to completely remove the error. The correction is then made over the same spot, using a slightly lighter touch than normal.

Clean the eraser after each erasure.

In making a correction in typed matter it is best to make the correction immediately rather than after typing several more lines. If you attempt to back up the typed Aluminium Master in the typewriter, the paper feed rollers will pick up the wet image and transfer it to the Master.

Should it be necessary to reinsert a typed Master into the typewriter, the typed image should be protected by a clean sheet of paper. The paper can then be torn off at the point where the correction is to be made. If any character becomes smeared, the entire word should be erased and retyped. Avoid touching typed matter at all times.

Aluminium Masters typed with a " Duro-clear " Universal ribbon should be used within a short period of being prepared, but the best results are obtained if the image is allowed to settle for one hour.

Images on Aluminium duplicating mediums can be protected, preserved, and filed for use at any future time. (See instructions under " *Keepeze.*")

MASTER COPY ON ALUMINIUM AND ZINC (PHOTOGRAPHIC IMAGE)

Aluminium Masters are also used for photographic master copy, and we suggest that you discuss the matter with your " Multigraph " Branch.

Zinc duplicating mediums are primarily intended for photographic master copy. They are too thick and stiff to be readily inserted in a standard typewriter. They can however be used advantageously for direct image master copy on certain special applications.

PHOTOGRAPHIC MASTERS . . .

Your " Multigraph " Branch is completely equipped to supply you promptly with Aluminium or Zinc duplicating mediums containing photographic master copy of highest quality at reasonable prices.

For best results, certain precautions should be observed in preparing your *original* copy for photographic reproduction.

COLOUR OF PAPER AND INK . . .

Original copy to be photographed should be in *black* ink on *white* paper. This applies to all subject matter discussed on the following page.

Light coloured paper such as blue, pink, canary on which lines or type text appear in heavy black ink, may sometimes be acceptable. Most coloured paper requires special camera operations which increase the cost to you.

Copy in dark red, or dark green inks on white paper usually photograph satisfactorily but black ink is always to be preferred. Light tints of any colour and particularly all shades of blue require special camera operations for which higher rates are charged.

TYPE TEXT MATTER . . .

Any matter already set in type such as letterheads, business forms, newspaper and magazine articles photograph satisfactorily provided the print is clear and uniformly inked. Impressions showing broken type characters and rule lines should be avoided.

DRAWINGS . . .

Line drawings, cartoons, and signatures in pen and ink, crayon, or brush will reproduce satisfactorily if the lines are distinct.

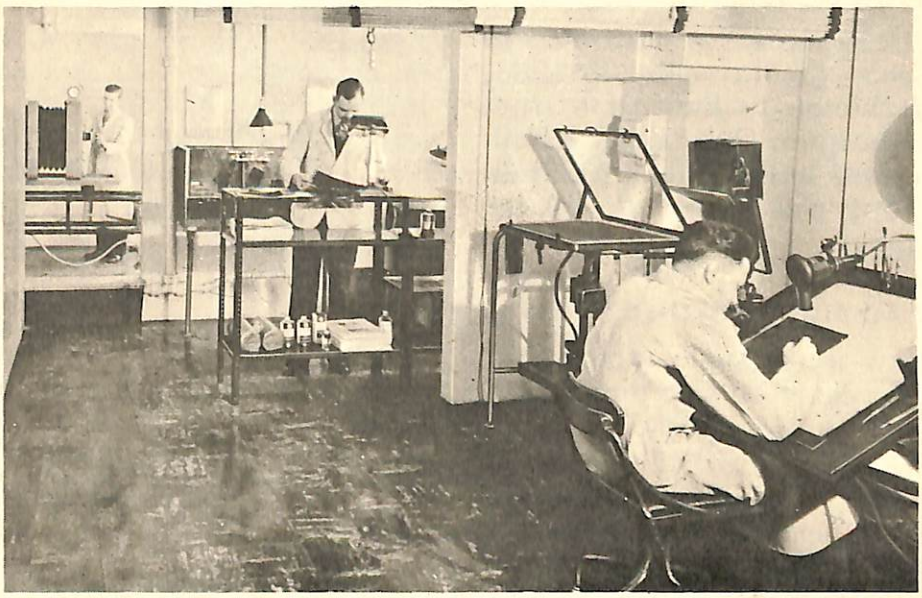
ENGRAVINGS . . .

Lettering and designs containing delicate lines and fine shading do not photograph well. In all such cases original drawings or art work should be furnished.

PHOTOGRAPHS . . .

To reproduce such subjects on the " Multilith " machine, they must be duplicated from halftones which should be made from retouched photographs or original art work. Halftones for reproduction on the " Multilith " machine are made from 120-line screened negatives. Printed halftones can sometimes be rescreened but the result is not satisfactory.

Grey, flat-toned photographs lacking in detail, without brilliant



11—A typical " Multilith " Master processing department

highlights or deep shadows, will give like effects in halftones made from them. The popular brown-tone portraits on rough, buff-coloured paper make very poor original copy. Best results are obtained from snappy, contrasty photographs on glossy paper, with full range of tones from bright highlights to solid blacks.

REDUCTIONS . . .

Original copy may be photographed same size or reduced or enlarged. If possible, original copy should be slightly larger than finished size as reduction will minimize flaws. Avoid enlargements as reproductions from them will be grainy—not sharp and distinct.

If original copy is to be duplicated in a different size, it is necessary to specify exact size wanted.

In giving sizes, " wide " refers to dimension from side to side; " high " refers to dimension from top to bottom. Do not give both dimensions unless you are certain your copy will reduce or enlarge accordingly.

HOW TO FIGURE REDUCTIONS. . .

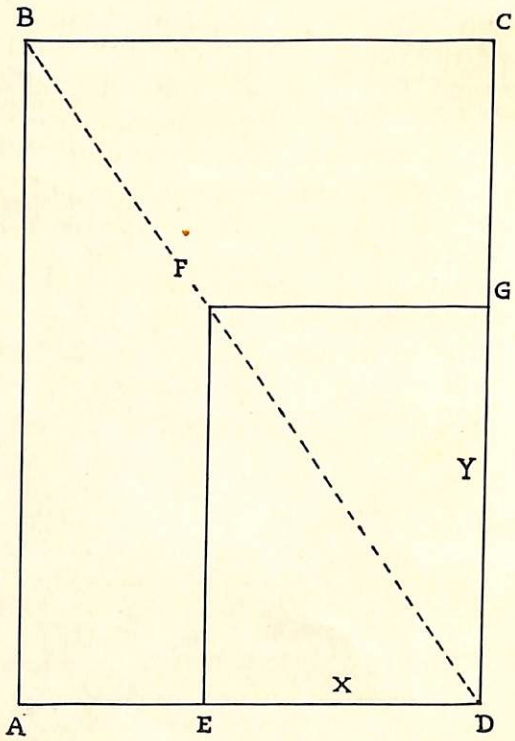
1—Draw a rectangle (abcd) that is the exact outside dimensions of the original copy.

2—Draw a diagonal line (bd) from the upper left corner to the lower right corner of the rectangle.

3—Lay off on the line to the left of the lower right corner of the rectangle the distance (x) which is the exact width of the desired reduction.

4—Draw a perpendicular line at point (e). This line will intersect the diagonal line (bd) at (f). From this point of intersection, draw a line (fg) parallel to line (ab).

5—The new rectangle (defg) will be the exact area of the desired reduction. Distance (y) is the height of the desired reduction.



12—Chart for Figuring Photographic Reductions

CROPPING . . .

Instead of reducing an entire illustration to fit available space, it is frequently better to show only a part of the original same size. This is called " cropping." The area to be retained is indicated by " crop " marks which should be clearly and accurately shown on the original illustration.

If the copy is an unmounted photograph, hold it against a window pane and draw crop marks lightly on the back; if it is a mounted photograph, put your marks on the margin of the mount using a grease pencil. Never put marks on the face of a photograph.

When using old illustrations, always erase old dimensions and instructions to avoid confusion with new marks.

Avoid the use of indelible pencils and rubber stamps on the backs of photographs. Before a photograph can be retouched, it must be mounted, and indelible ink shows through the print and will reproduce.

RETOUCHING . . .

Finest duplicating from any Aluminium or Zinc duplicating master containing halftones can be assured only by using the best original copy obtainable. The camera " sees " only what is in the original. It cannot improve. It reproduces the bad as well as the good points.

Original copy can often be improved by careful retouching. The slight expense for artist's time will be repaid in improved results.

FILING . . .

Drawings and retouched photographs which will be filed for future use should always have the face protected. Flies, dirt, and scratches have ruined many pieces of fine art work causing needless expense for restoring to proper condition.

DESPATCH . . .

If drawings or photographs are to be packed for despatch, use extra precautions to protect them against bending or cracking. *Never* fold photographs — always despatch flat.

ADJUSTING and PREPARING
"MULTILITH" DUPLICATOR
MODEL 1250
FOR OPERATION

LEVELLING MACHINE . . .

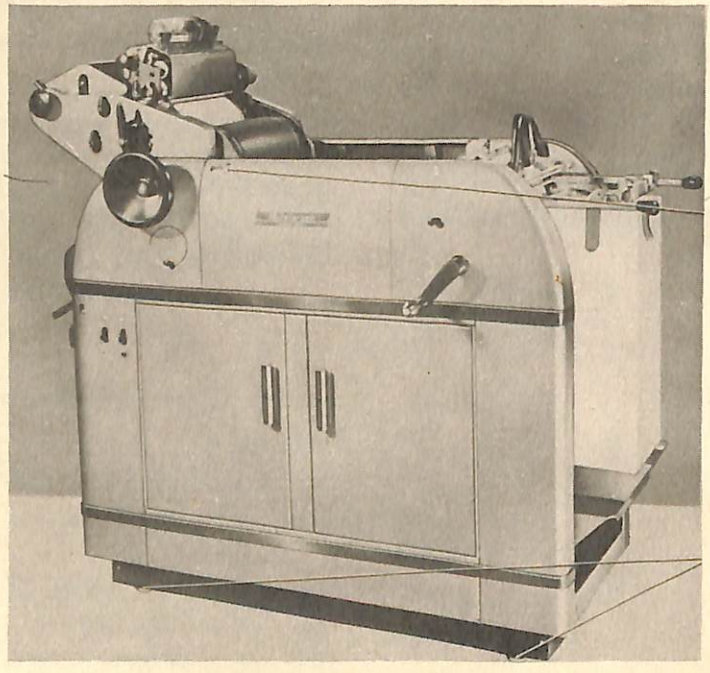
The Duplicator must rest firmly on the floor and the "*Repelex*" solution must stand level in the fountain. There is an adjustable foot in each corner of the angle iron frame. To level Duplicator to floor it is usually necessary to adjust only one foot. Next, fill the fountain of the moistening mechanism with "*Repelex*" solution. Then re-adjust feet until the surface line of the liquid is level in the fountain. Feet are adjusted with a screw driver and held in position with lock nuts.

SETTING IMPRESSION COUNTER . . .

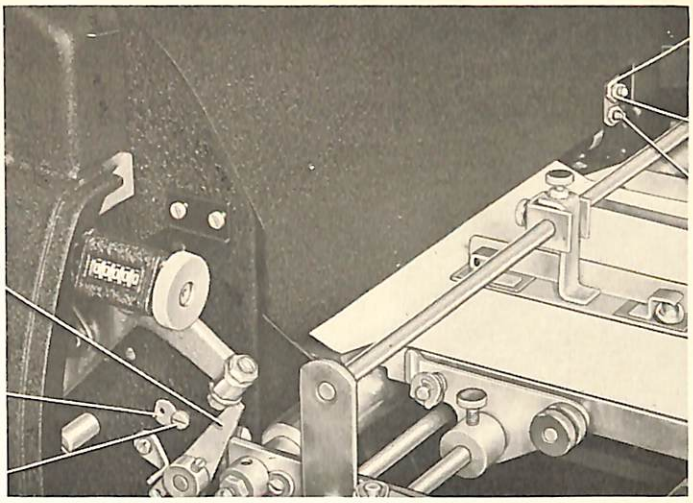
When starting a run, the impression counter should be reset to zero by turning the knurled knob in a clockwise direction until all wheels clear. (See Illustration No. 13.)

PAPER FEED ROLLERS . . .

To assure proper feeding of paper, lower feed roller must be parallel to upper feed roller. Pressure between rollers must be equal. To test both parallel and over-all pressure, cut two strips of 21 pound paper 1 inch wide and place



13—Adjustable Feet for Levelling Duplicator



14—Adjustments for Paper Feed Rollers and Stop Fingers

them between and toward each end of the rollers. Revolve the cylinders by means of the hand-wheel until upper feed roller contacts lower feed roller. Tension between the rollers should be firm, and resist pulling the paper strips from between the rollers, but not so heavy as to cause the paper to tear.

If tension is unequal, loosen clamp screw for eccentric bearing, turn bearing until an equal tension is obtained, and lock the adjustment with clamp screw. Turning bearing counter - clockwise lowers left end of lower paper feed roller and vice versa. The flat edge of bearing head should always be towards rear of machine.

The over-all tension should be light when checking the levelling of the lower feed roller. To increase the over-all tension, loosen lock nut and turn adjusting nut in a counter-clockwise direction, and tighten lock nut.

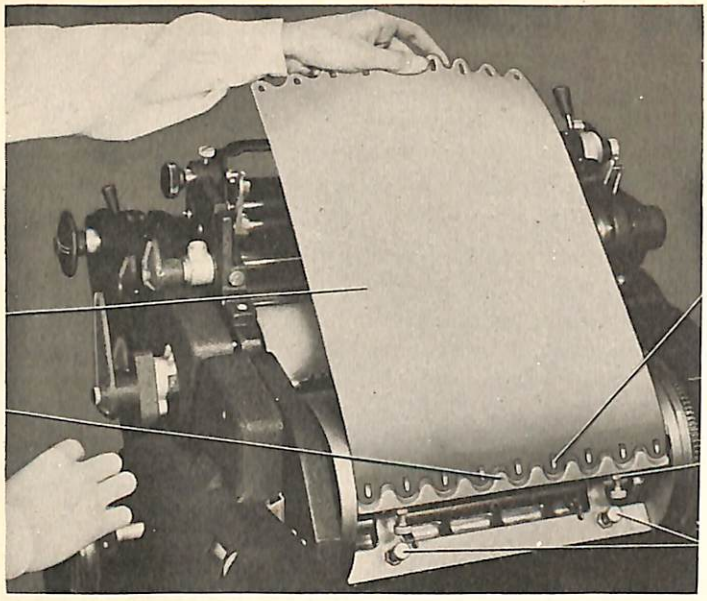
PAPER FINGER SHAFT . . .

The tips of the paper fingers should be slightly below the surface of the base for proper clearance, when paper feed rollers are in contact. To adjust paper finger shaft, loosen nut on adjusting screw, and turn screw clockwise to lower the fingers. Lock adjustment with nut.

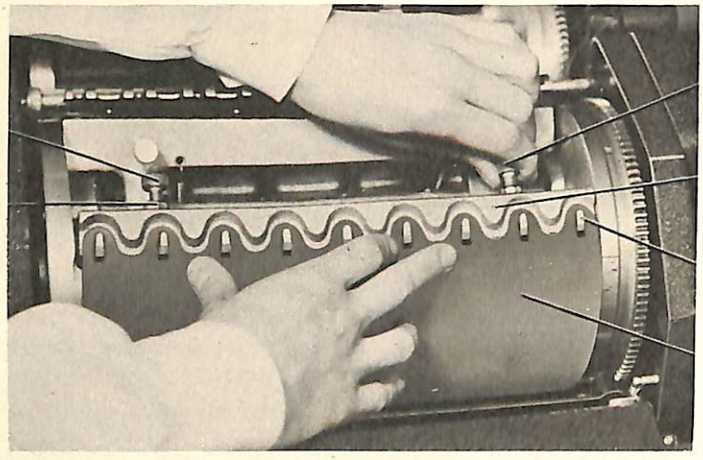
ATTACHING BLANKET . . .

The blanket is attached to the blanket cylinder from the front of the machine. Revolve the cylinder until the blanket hooks are toward the front of the machine. Attach loops of one end of blanket to upper set of hooks. Revolve cylinder, holding blanket taut, until lower set of hooks is toward front of machine. Attach loops at other end of blanket to lower set of hooks and tighten all clamp screws evenly.

Now start the machine and contact the impression cylinder to blanket cylinder by holding the detent pawl in operating position



15—Attaching Blanket to Upper Hooks



16—Attaching Blanket to Lower Hooks

for 50 revolutions. (See Illustration No. 14.) Again tighten both sets of clamp screws to make certain blanket conforms perfectly to the surface of the blanket cylinder. Lock clamp screws with lock nuts. Repeat this operation.

NOTE: It is important that blanket is tight on the cylinder. Double images are frequently caused by a loose blanket. Do not overdo the tightening of the blanket as you may tear the end loops.

CLEANING THE BLANKET . . .

Thoroughly clean the blanket with *Blanket Wash* before putting the Duplicator into operation. The rubber surface is vulcanized to the canvas backing. If the blanket has stood for some time, a fine powder or " bloom " may come to the sur-

face. This coating must be removed, possibly by two thorough cleanings.

ADJUSTING PRESSURE BETWEEN IMPRESSION AND BLANKET CYLINDERS . . .

Contact pressure between impression cylinder and blanket cylinder is adjusted at the Factory for paper of 21-pound weight. Transportation may disturb this adjustment so it is advisable to recheck it.

To change impression cylinder pressure, loosen clamp screw and turn worm knob in clockwise direction to *decrease* or in a counter-clockwise direction to *increase*. When correct adjustment is obtained, lock adjusting sector with clamp screw. This adjustment must be made whenever a change is made in the thickness of paper being fed.

Excessive pressure will ruin the blanket. Poor quality duplicating will also result (particularly on halftones) as all lines will appear broadened and distorted. If pressure is too light, low spots will show up in the image and type characters will appear broken.

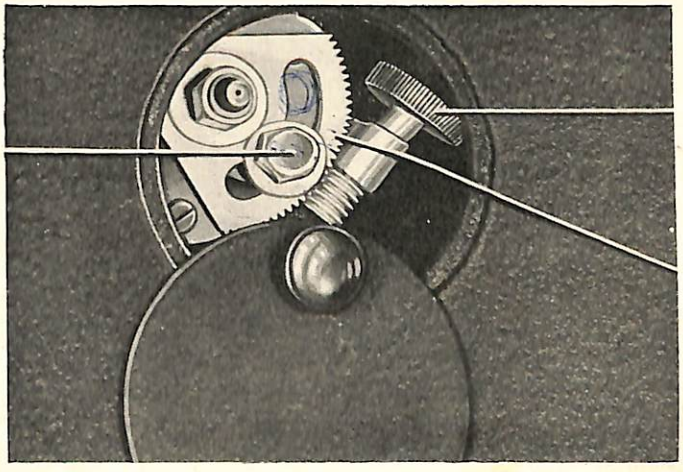
CAM BAND . . .

Attached to the right end of the blanket cylinder is a cam band which actuates the elevating frame for upper paper feed roller. The position of the cam determines whether the sheet enters the paper grippers properly.

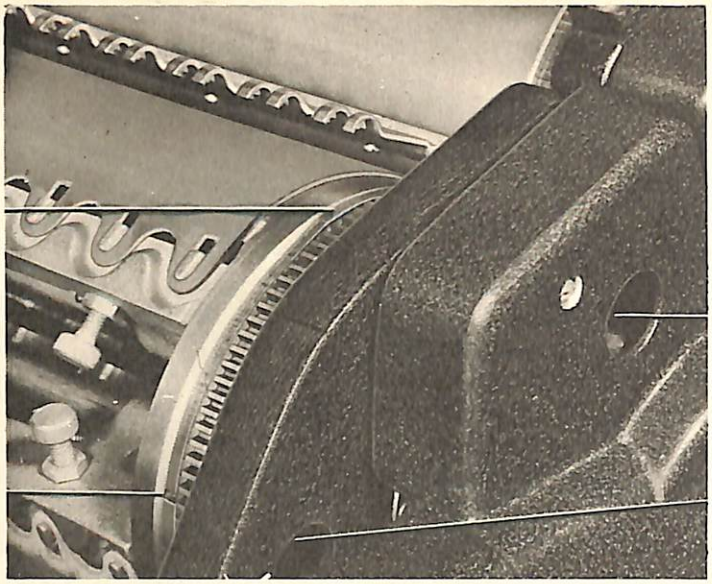
ADJUSTING THE CAM BAND . . .

The cam band is set at the factory for paper of average weight and thickness. This normal position is with the cam $\frac{1}{2}''$ above the leading edge of the opening in the blanket cylinder. When feeding thick paper, the paper feed rollers must first be adjusted to the thickness of stock. Then adjust the cam band in relation to the gripper fingers.

Place a sheet of the paper being fed on the carrier tapes of the conveyor board in contact with the paper stop fingers. Standing at rear of machine, revolve cylinders with right handwheel (clockwise) until gripper fingers just begin to open. If lead edge of sheet is not entering the gripper fingers or is being nicked by the paper stop



17—Adjusting Impression Cylinder Contact Pressure



18—Adjusting Cam Band

plates, the cam band must be retarded by moving it toward rear of machine. If lead edge of sheet is entering the gripper fingers but is not in contact with the paper stop plates, the cam band must be advanced by moving it toward front of machine.

To move cam band, revolve blanket cylinder until opening is in line with red line on right side plate of Duplicator. Loosen three clamp screws on right end of blanket cylinder (through holes in right side plate) and move cam band by inserting blade of screw driver in notch in cam band. Only a very slight movement of cam band is necessary to accomplish adjustment. Fasten three clamp screws tightly.

INKING MECHANISM . . .

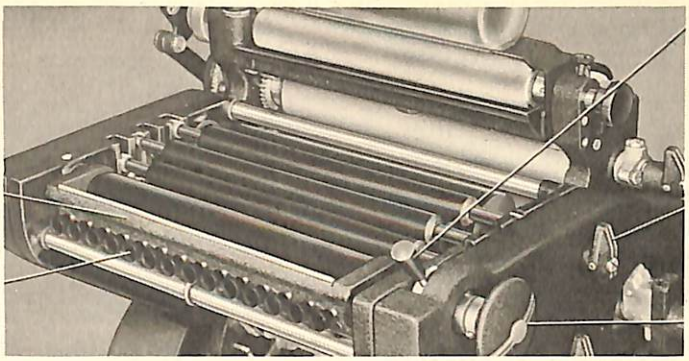
The inking mechanism on your "MULTILITH" DUPLICATOR is designed to distribute a thin film of ink to the image on the duplicating master. The ink flow and feed can be controlled to cover images ranging from light lines to heavy solids.

The inking mechanism consists of an ink fountain with 14 adjusting screws to control ink flow, a 5-position ratchet to control ink feed, and 10 inking rollers . . . 2 form rollers, 1 fixed oscillating roller, 3 intermediate idler rollers, 1 large oscillating roller for increased ink-carrying capacity, 1 fixed lower distribution roller, 1 ductor roller, 1 fountain roller.

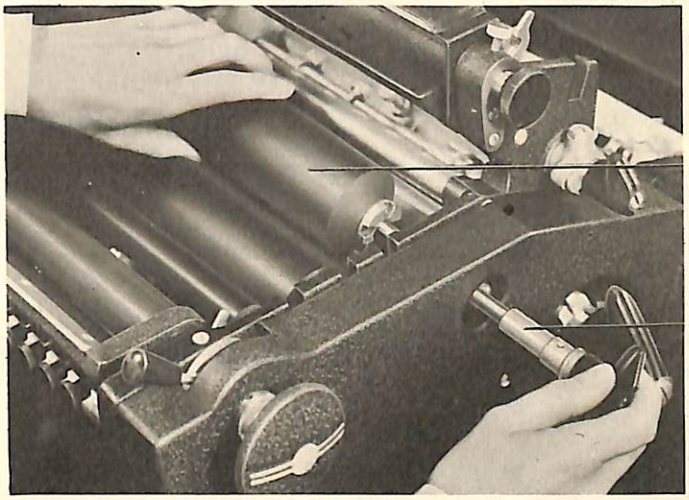
PLACING INKING ROLLERS . . .

Place form rollers in position first. They are mounted on eccentric shafts which contact them with the duplicating master. They are interchangeable and may be placed either end, to right or left on the shafts.

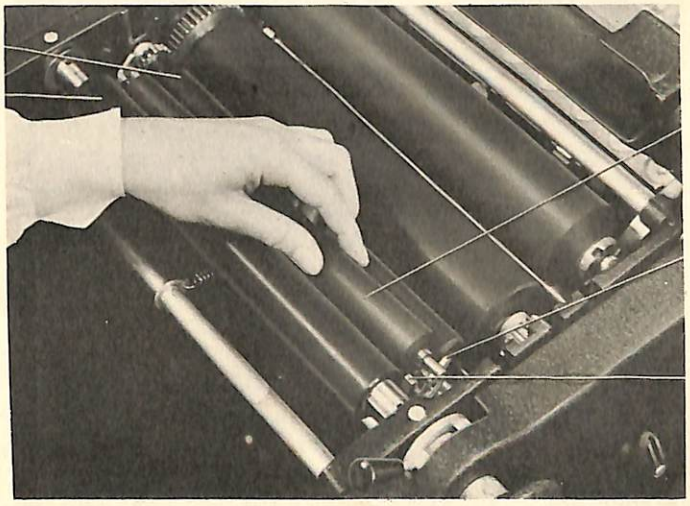
Place ductor roller in U-bracket when bracket is centred between lower (fixed) distribution roller and fountain roller. It is held in



19—Inking Mechanism



20—Placing Ink Form Rollers



21—Placing Ink Ductor Roller

position by spring latches at each end. To centre bracket, revolve cylinders by handwheel.

Next, place all three idler rollers (with bearings) in slots . . . first idler in contact with upper form roller, second idler in contact with fixed oscillating roller, third idler in contact with lower fixed distribution roller.

Now place the large oscillating roller in groove, in contact with 2nd and 3rd idler rollers.

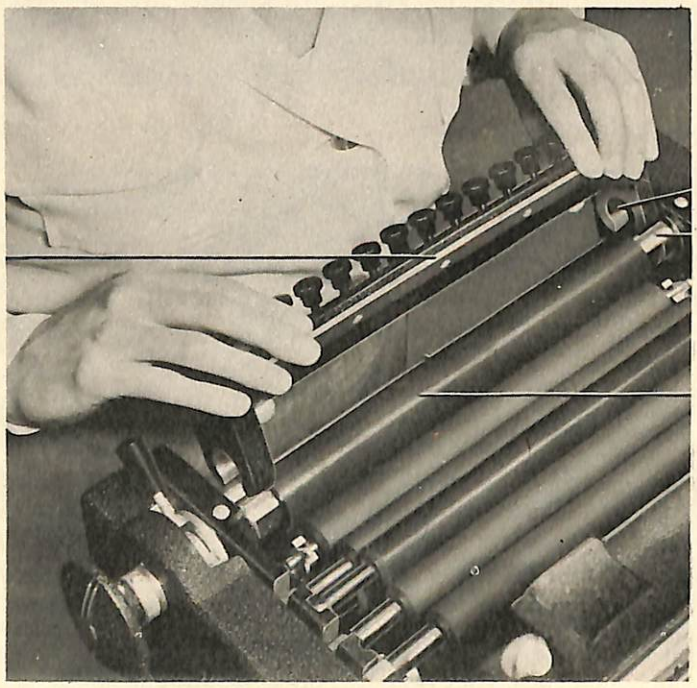
INK FOUNTAIN . . .

Place ink fountain over fountain roller with ink trough toward front of Duplicator and adjusting screws pointing upward. Slip the horseshoe openings at each end of the fountain over the fountain roller bearings and press down firmly. Swing fountain backward into operating position with adjusting screws parallel to floor.

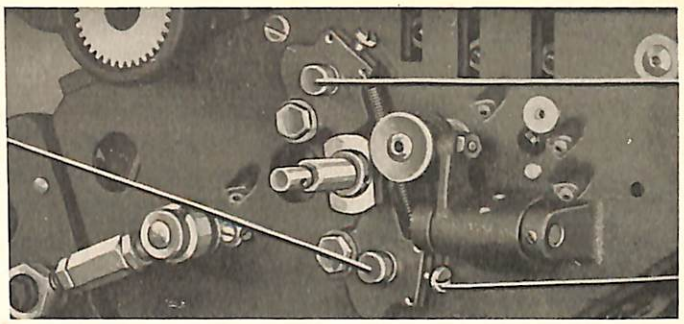
ADJUSTING INK FORM ROLLERS . . .

The ink form rollers must be parallel to duplicating master on cylinder. To check, cut two strips of 21-pound paper 1 inch wide. Place them between form roller and cylinder for duplicating master, one at each end. Contact form roller to cylinder by turning eccentric shaft counter-clockwise by means of lever on end.

If tension on strips is unequal, it will be necessary to adjust eccentric bearing for right end of roller shaft. To make this adjustment, the right side cover plate must be removed from the inking mechanism. Loosen set screw for eccentric bearing and turn bearing until the tension is equal. Tighten set screw to hold bearing in correct adjustment. Adjust both upper and lower form rollers in this manner.



22—Attaching Ink Fountain



23—Adjusting Eccentric Bearings for Right End of Roller Shafts

24—Adjusting Ink Form Rollers

The pressure of ink form rollers against duplicating master is important. Too little pressure will not apply a film of ink to the image . . . too much pressure will cause undue wear on image and is a frequent cause of " tone " in background. To check, use two strips of paper placed as explained in preceeding paragraph. With roller in contact with cylinder for duplicating medium, release Allen set screw in form roller shaft lever and turn eccentric shaft counter-

clockwise (by means of screw driver in slot in end of shaft) until a slight " pull " can be felt as paper strips are withdrawn. Lock adjustment with Allen set screw. Adjust both upper and lower form rollers in this manner. Levers must point to rear when form rollers are contacting duplicating master.

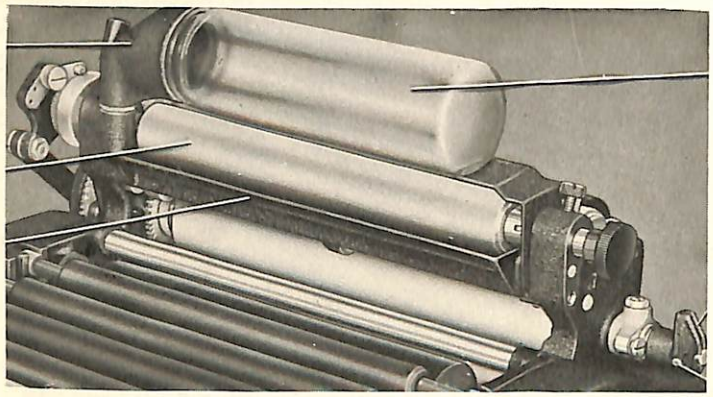
MOISTENING MECHANISM . . .

The moistening mechanism functions in harmony with the inking mechanism. Its purpose is to distribute a solution called " *Repelex* " to all non-image areas of the duplicating master. This film of " *Repelex* ", renewed at each machine revolution, prevents ink adhering to these blank areas —keeps the background clean and free from " tone."

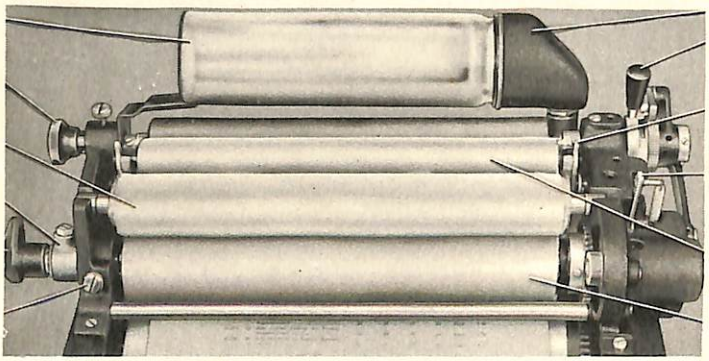
The moistening or " *Repelex* " mechanism consists of a fountain with a horizontal glass reservoir for " *Repelex* " solution, an 11-position ratchet to control feed of solution uniformly over entire duplicating master, a molleton-covered form roller, a linen-covered cleaner roller, a molleton-covered ductor roller, and a knurled metal fountain roller.

PLACING "REPELEX" ROLLERS . . .

The form roller is mounted on an eccentric shaft which contacts it with the duplicating master. The cleaner roller is dropped into a slot so that it contacts the form roller. The ductor roller is placed in a U-bracket and held in position by spring latches at each end. The



25—Moistening Mechanism



26—Adjusting Eccentric Bearing for " Repelex " Form Roller

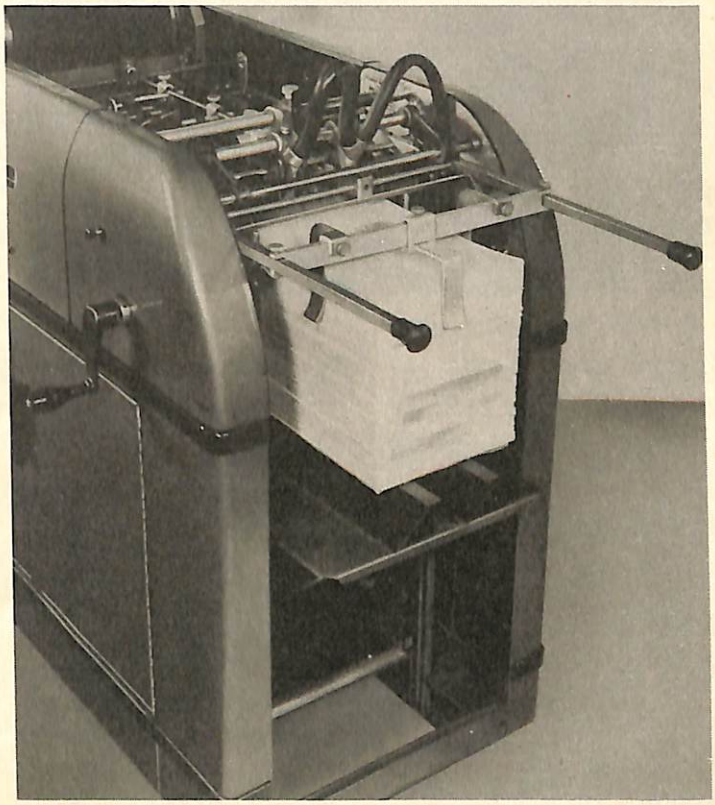
bracket should be centred between cleaner roller and fountain roller by revolving cylinder with hand-wheel. The fountain roller normally remains in the "*Repelex*" mechanism but is quickly removed for cleaning.

ADJUSTING "REPELEX" FORM ROLLER . . .

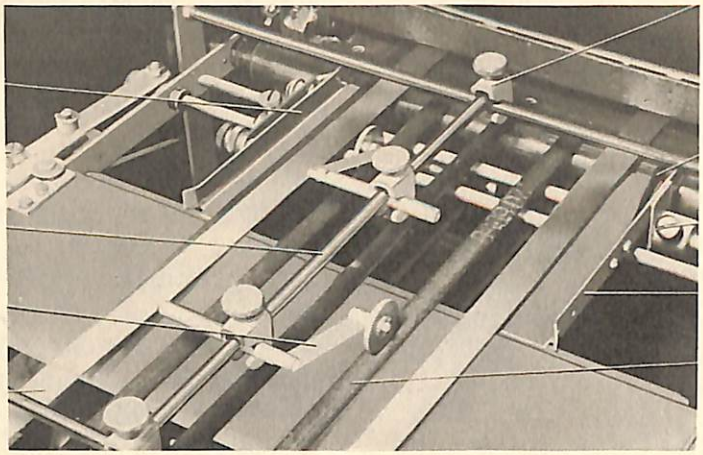
The form roller must be parallel to duplicating master on cylinder. To check, cut two strips of 21-pound paper 1 inch wide. Place them between form roller and cylinder for duplicating medium, one at each end. Contact form roller to cylinder by turning eccentric shaft counter-clockwise by means of lever on end.

If tension on paper strips is unequal, release locking screw and turn eccentric bearing until tension on strips is equal. Tighten locking screw to hold bearing in correct adjustment.

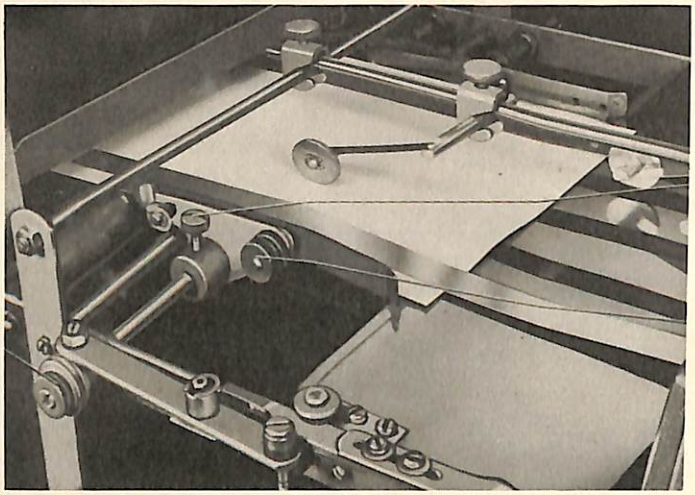
The pressure of form roller against duplicating master is important. Too little pressure will not properly apply "*Repelex*" solution . . . too much pressure will cause undue wear on image. To check, use two strips of paper placed as explained in preceding paragraph. With roller in contact with cylinder for duplicating medium, release Allen set screw in form roller shaft lever and turn eccentric shaft (by means of screw driver in slot in end of shaft) until a fairly heavy "pull" can be felt as paper strips are withdrawn.



27—Automatic Vacuum Paper Feeder



28—Adjusting Right and Left Paper Guides



29—Jogger Guide Adjustments

Lock adjustment with Allen set screw. Lever must point to rear when form roller is contacting duplicating master.

AUTOMATIC VACUUM PAPER FEEDER . . .

A wide range of paper stocks in a great variety of fancy surface finishes can be fed on the automatic vacuum paper feeder. Weights from 13-pound bond to 3-sheet card are handled with a minimum of adjustment. To become familiar with normal adjustments, the sequence for an average job will be outlined in relation to the major units.

ADJUSTING PAPER GUIDES ON CONVEYOR BOARD . . .

Place a sheet of the paper, to be used for checking feeder adjustments, on the carrier tapes of the conveyor board so the lead edge is squarely in contact with the paper stop fingers. Position it from side to side so that it is centred between right and left edges of the rubber blanket. Revolve handwheel until

cam roll is on high part of cam bar. This will move shaft, which operates left paper guide, to its extreme right limit. At this point, set the left paper guide so that it slightly jogs the sheet to the right. Then bring right paper guide up to right edge of sheet so that guide spring for sheet is very slightly compressed.

JOGGER GUIDE . . .

The left paper guide is a jogger guide. It has three adjustments . . . the first for approximate location; the second for fine micrometer settings; the third for twisting the sheet to square up the lead edge with the paper stop fingers.

CARRIER TAPES . . .

Five carrier tapes travel down the conveyor board. As they stretch in use, the slack may be taken up by raising the tape guide bar. The two outer tapes should ride over the bottom flanges of the paper guides. The three centre tapes should be spaced equi-distant by moving the tape guides attached to the guide bar. (See illustration No. 28.)

SHEET RIDER . . .

A sheet rider, consisting of 2 knurled wheels placed over the middle carrier tapes, forces all sizes of paper positively against paper stop fingers, assuring accurate vertical register. For very light weight paper, sheet rider can be raised out of contact with carrier tapes. (See Illustration No. 28.)

CONVEYOR ROLLS . . .

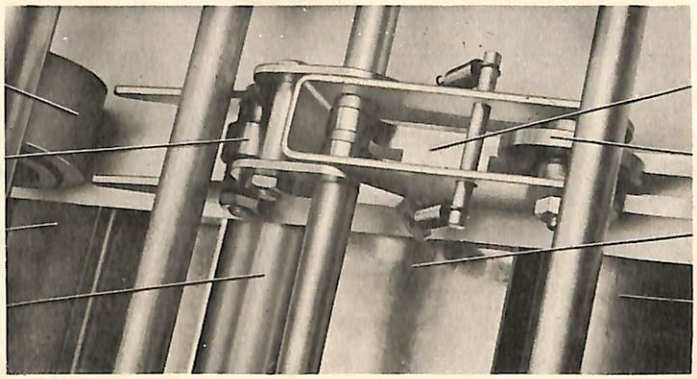
The function of these two rolls is to carry the sheet from the pullout rolls on to the conveyor tapes and under the sheet rider. They are movable from side to side and remain in position by friction on the rod which supports them. When located to place the steel pressure strips over the outside carrier tapes, they need no further attention as they are under constant spring pressure. (See Illustration No. 30.)

PRESSURE STRIPS . . .

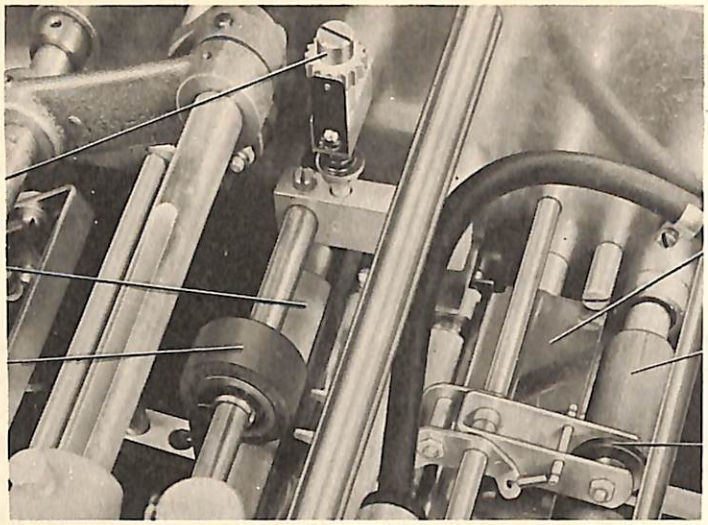
Two spring steel pressure strips are attached to the conveyor roll. They provide correct pressure against carrier tapes for all weights of paper stock, cause the sheet to lie flat on the carrier tapes, and prevent edges of the sheet curling up. (See Illustration No. 30.)

UPPER PULLOUT ROLLS . . .

These rolls serve to pull the sheet off the stack after the sheet



30—Conveyor Rolls



31—Pullout Rolls

has been raised and inserted under them by the suction feet. They should be centred from side to side in relation to the suction feet and the right and left channel guides. Pressure between upper and lower pullout rolls should be even and not too heavy to avoid wearing flat spots on upper rubber rolls.

Should it ever be necessary to adjust tension between upper and lower rolls, insert a 1″ strip of 21-pound paper under each of the upper pullout rolls. To increase tension, turn the notched adjusting screws counter-clockwise. Apply only enough pressure to pull sheet off stack and carry it to conveyor rolls. (See Illustration No. 31.)

LOADING PAPER MAGAZINE . . .

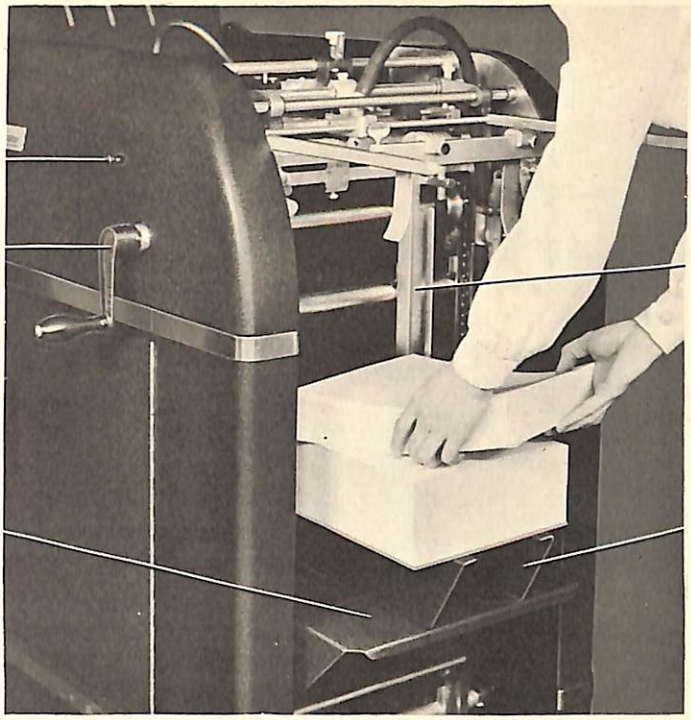
An elevator mechanism is provided to raise and lower paper stack. To load paper magazine, lower paper table by holding release button to right and turning crank counter-clockwise. Set the right channel guide so that the sheet, as it travels on carrier tapes, will clear the spring guide finger on right jogger guide by $\frac{1}{16}$″ to $\frac{1}{8}$″. Set left channel guide to width of sheet to be fed. Right and left paper supports should be set approximately $1\frac{1}{2}$″ from right and left channel guides and fastened with wing screws.

CARDBOARD FOUNDATION FOR STACK . . .

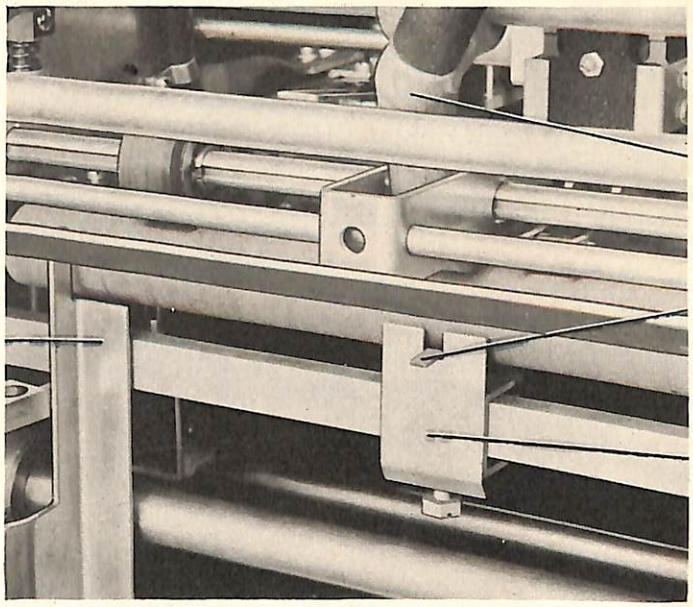
Paper stack should not rest directly on paper supports as it will sag in the centre. A piece of heavy cardboard $\frac{1}{8}$″ thick should be cut $\frac{1}{4}$″ shorter and $\frac{1}{4}$″ narrower than size of paper being fed. Place this cardboard on paper supports and pile paper on it.

MAGAZINE CAPACITY . . .

Paper magazine has a capacity of 21 inches or the equivalent of 5,000 sheets of 21-pound weight. Fill magazine with paper to be run, in 500-sheet lifts. Push each lift squarely against rear flanges of right and left channel guides so that sheets will feed straight from magazine. Raise paper table by turning crank clockwise until top



32—Loading Paper Magazine



33—Sheet Separator

of stack is $\frac{1}{2}$″ below top of sheet separator bracket. Top of stack should never be raised above sheet separator finger.

SHEET SEPARATOR . . .

A small, flexible brass finger known as a sheet separator, prevents suction foot picking up more than one sheet from the stack. The sheet separator is attached to a bracket so that it projects $\frac{3}{16}''$ out over the lead edge of the stack. For thin stock, the sheet separator should project slightly more than $\frac{3}{16}''$ from the separator bracket. The sheet separator should be removed, and the bracket replaced, when feeding card stock. The bracket is movable and should be placed so the sheet separator is at centre of lead edge of paper midway between right and left channel guides. Suction foot is also moveable and should be placed directly over the sheet separator finger. (See Illustration No. 33.)

FANNING PAPER . . .

Paper usually comes from the supplier in 500-sheet "lifts" or piles. These piles should be well "fanned" and jogged to separate sheets and allow air to enter between sheets. It is advisable to keep sheets in same order as the lift comes from the paper cutting machine.

HEIGHT OF PAPER STACK . . .

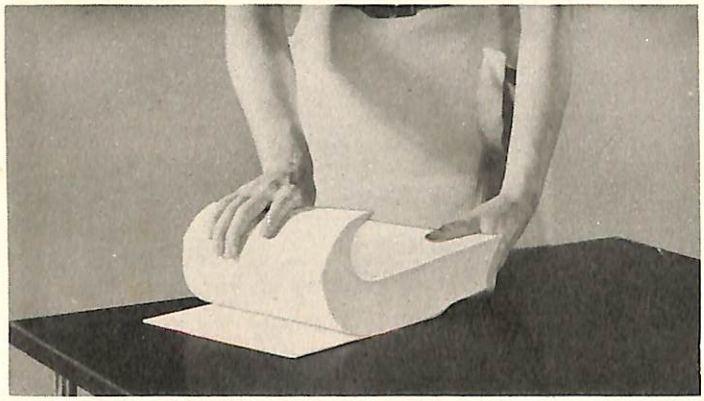
The height of paper stack in relation to bottom of suction foot is controlled automatically during operation. If stack does not maintain proper height to feed single sheets consistently, turn self-locking adjusting nut in proper direction as indicated on head . . . "raise" if feeder skips; "lower" if feeder picks doubles. Before changing this adjustment, be sure there is sufficient vacuum at suction foot to pick up sheets. (See Illustration No. 35.)

PAPER HEIGHT CONTROL BAR . . .

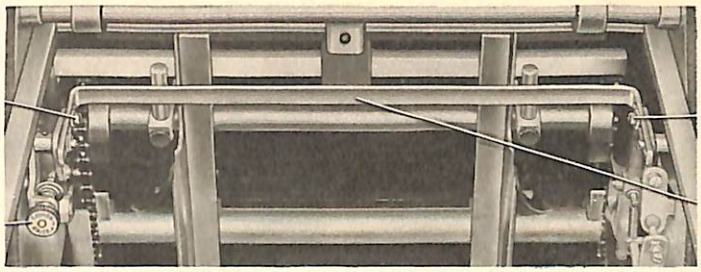
The speed at which stack rises is determined by position of height control bar. Normal position is $1\frac{1}{2}''$ in front of suction foot when foot is in its lowest position. To make stack raise slower when feeding thin paper, move bar toward suction foot. To make stack raise faster when feeding thick paper, move bar away from suction foot.

PAPER GUIDES ON MAGAZINE . . .

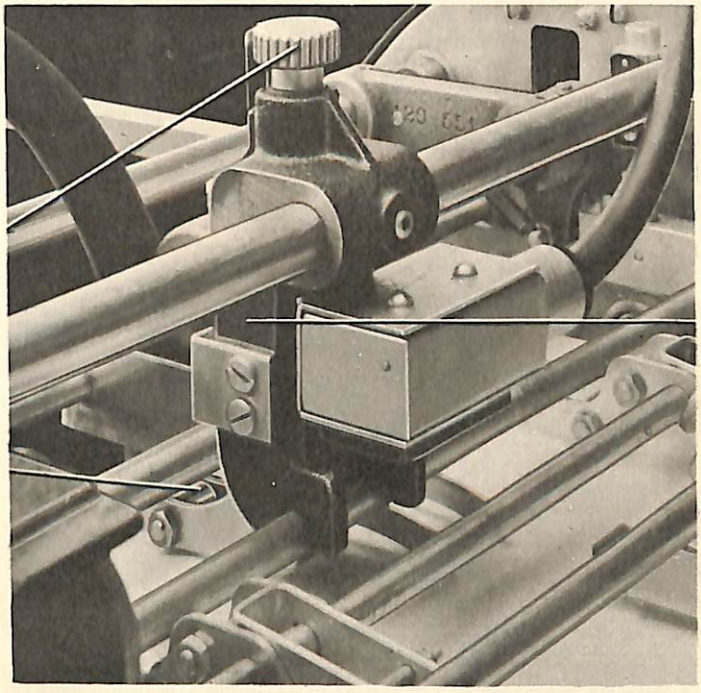
When paper stack has been raised to proper operating height, move cross bar for paper guides up and parallel to trailing edge of



34—Fanning a Lift of Paper Stock to Separate Sheets



35—Paper Height Control Bar



36—Multiple Sheet Detector

sheets. Paper stop should press snugly against stack to hold it firmly against rear flanges of right and left channel guides. Right and left paper guides should then be brought into light contact with sides of paper stack.

MULTIPLE SHEET DETECTOR . . .

This device prevents more than one sheet passing along conveyor board into Duplicator. It is electrically actuated and is controlled by sheets passing between a small detector roll and the lower pullout roller. When properly adjusted, single sheets will pass through but two or more sheets will be deflected into catcher pan below conveyor board.

To adjust, turn notched knob slowly in direction marked "lower" until detector roll just contacts lower pullout roller. Now turn knob slowly in direction marked "raise" until detector roll stops revolving, and then

" raise " knob two more notches. This adjustment will handle 18 or 21-pound paper. If single sheets are occasionally deflected into catcher pan, turn knob one more notch in direction marked " raise." For thick paper or card stock, " raise " detector roll two more notches.

VACUUM PUMP . . .

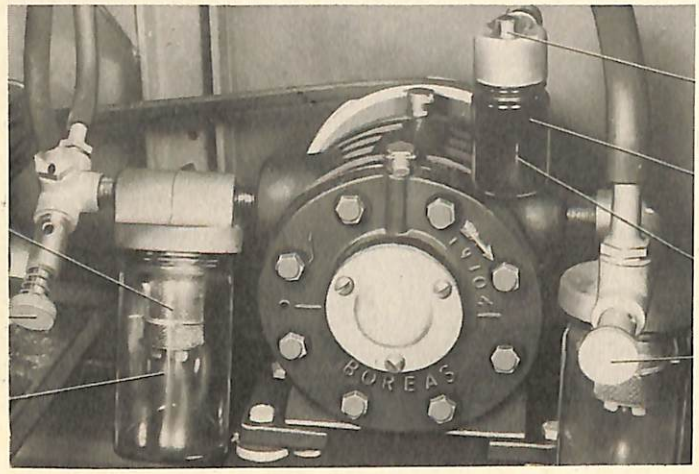
An important unit of the automatic paper feeder is the vacuum pump which provides suction for lifting sheets off the stack. It has a 4-vane rotor mounted in grease-packed ball bearings for maximum efficiency and long life.

AIR FILTERS AND MUFFLERS . . .

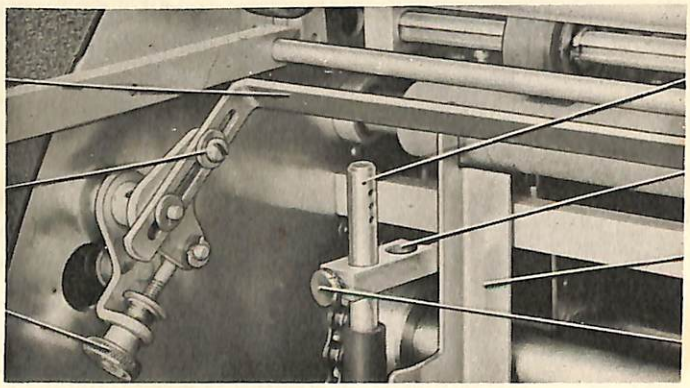
Two combination air filters and mufflers—one intake and one outlet—are provided. Filters are double copper wire mesh—one fine and one coarse—covered with oil film and surrounded by large glass-enclosed air spaces. They are easily removed for cleaning and addition of fresh oil film to renew efficiency.

OILING PUMP . . .

A visual oiling system, automatic in operation, assures correct lubrication of the vanes as they ride against the interior of the housing. Avoid excessive lubrication. When



37—Vacuum Pump for Automatic Paper Feeder



38—Air Blower Tube

filling oil reservoir, replace cap tightly. The feed wick allows correct amount of oil to reach vanes.

AIR BLOWERS . . .

These are two tubes with three holes each, mounted just outside of right and left channel guides. Their function is to aid in sheet separation by ejecting streams of air against the corners of the lead edge of the sheet. Air blower tubes should be adjusted so the upper holes are toward and just above the top of paper stack. The air stream should flutter top sheets of stack.

ADJUSTING VACUUM AND BLOW . . .

The right adjusting screw (facing the pump as it is mounted in the cabinet) controls the volume of vacuum at suction foot. To increase vacuum, turn the self-locking knurled knob on needle valve clockwise. The left adjusting screw controls the pressure of air stream at blower tubes. To increase air pressure, turn knurled knob clockwise. For maximum life of pump and greatest efficiency in operation, use minimum vacuum and air blow.

EJECTOR MECHANISM . . .

After the impression has been made, the sheet is released from the gripper fingers at the rear of the Duplicator. Positive ejection is assured by automatic ejector pins in the anvil bar, paper strippers permanently attached to the stripper bar, two upper ejector rolls, a lower ejector roller, and two ejector rings.

EJECTOR ROLLS . . .

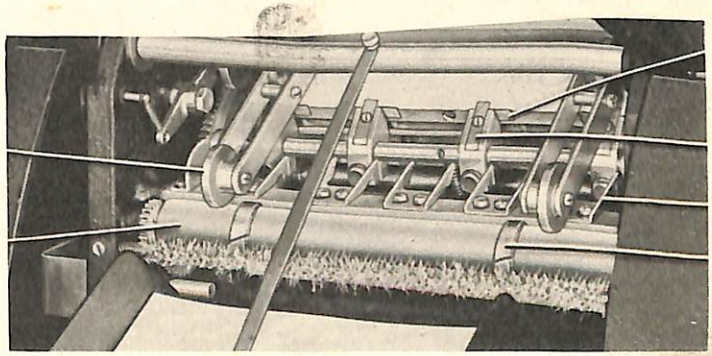
The upper ejector roll assemblies can be moved along the shaft to which they are attached. To determine correct position, lay a sheet of paper on conveyor board in contact with paper stop fingers. Revolve cylinders by handwheel until lead edge of sheet is just past lower ejector roller. Now locate upper ejector rolls so they ride on extreme right and left margins of the sheet. If they are allowed to roll over the inked impression, they will streak the sheet.

EJECTOR RINGS . . .

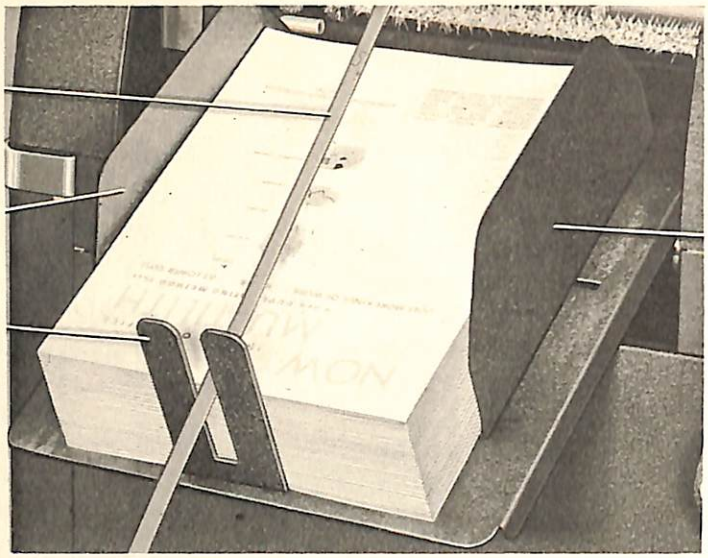
These rings can be slid along the lower ejector roller. Set them outside the upper ejector rolls for paper that is curled down; set them inside the upper ejector rolls for paper that is curled up.

PAPER RECEIVER . . .

After setting ejector rolls and before sheet is completely ejected from the Duplicator, set the right



39—Paper Ejector Mechanism



40—Paper Receiver

and left paper guides of paper receiver so that the sheet as it leaves the ejector mechanism will have $\frac{1}{8}$" clearance on each side between the guides. The side guides should be set on an angle so there is greater clearance as the sheet enters. The paper stop should be set to allow trailing edge of sheet to completely clear ejector mechanism.

PAPER RETAINER . . .

This is a spring steel strip which deflects the sheet into paper receiver. It is attached with a thumb screw to cross rod above ejector rolls and rests on the sheets as they eject.

FEEDING ENVELOPES . . .

Envelopes must be fed lengthwise, with flap down. To assure that they enter the paper feed rollers squarely against the paper stop fingers, the sheet rider should be placed so it rests along the centre of the envelope to press down the loose flap fold. Carrier tapes must be set so one travels down each edge of the envelope and one down the centre under the sheet rider. The sheet separator should be removed, and the bracket replaced. An old blanket should be used when feeding envelopes.

FEEDING CARD STOCK . . .

When feeding post cards and other heavy card stock, the sheet separator should be removed and the bracket replaced. If stock is maximum thickness, an old blanket should be used. The paper height control bar, the volume of vacuum at suction foot, the air blowers, the multiple sheet detector, the upper paper feed roller, the cam band, and pressure between impression and blanket cylinders must be adjusted to the thickness of the stock being fed. Post cards must be fed lengthwise.

FEEDING FOLDED STOCK . . .

Most folded stock can be fed successfully with the folded edge under the suction foot. The paper

magazine cannot be filled to capacity as a top level must be maintained. Approximately 500 folded sheets can be placed in the magazine at one loading. When feeding with the fold on the side, one paper support should be located under the open edge, and the other under the centre of the sheet away from the folded edge so as to keep the pile as level as possible. The sheet separator must be removed and the bracket replaced. Both air blowers should be mounted so as to direct the air streams against the folded edges of the sheets.

VARIABLE SPEED CONTROL . . .

A quickly-responsive mechanism, actuated by a conveniently located knob, provides operating speeds ranging from 3,000 to 6,000 revolutions per hour. A glance at the indicator dial shows machine speeds.

STARTING DUPLICATOR . . .

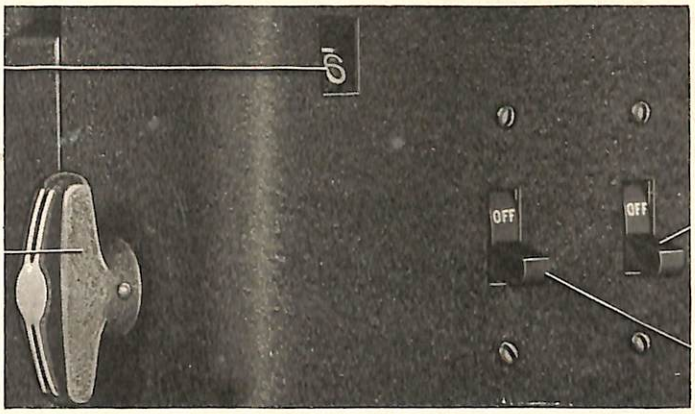
After making adjustments to automatic paper feeder as outlined above, start the Duplicator to check their accuracy. Below and to the right of the speed indicator dial, are two toggle switches—the left, for the electric motor driving the Duplicator; the right, for electric motor driving vacuum pump. In starting the Duplicator, always switch on the motor for the Duplicator first, followed by the motor for the vacuum pump. With variable speed indicator set at 3,000 r.p.h., feed 25 or 50 sheets and observe mechanical action. If slight changes in adjustments are required to correctly feed and eject sheets, they can be made now.

FILLING "REPELEX" FOUNTAIN . . .

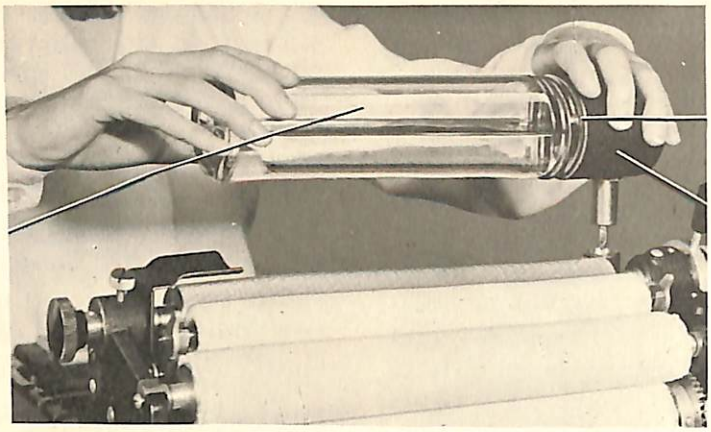
Fill the glass reservoir on the moistening mechanism with "*Repelex*" solution in proper proportion. (See "Ink" and "Repelex" in Section Five.) Attach angle spout tightly (a rubber gasket is provided to prevent leakage of either "*Repelex*" solution or air) and mount on fountain as shown in illustration No. 42. The spill-proof spout automatically maintains proper level of solution in fountain.

FEEDING "REPELEX" SOLUTION . . .

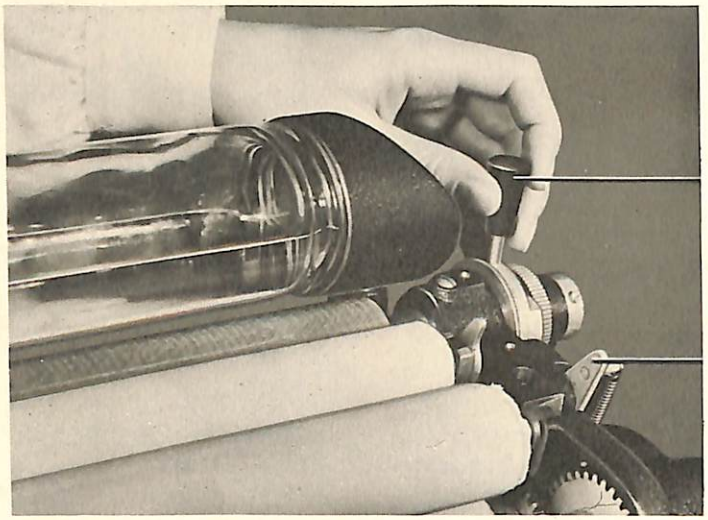
The feed of "*Repelex*" is regulated by an 11-position ratchet located at right side of moistening



41—Variable Speed Control



42—Attaching " Repelex " Reservoir



43—Feeding " Repelex " Solution

mechanism. When ratchet control lever is in *up* position toward rear of Duplicator, the maximum quantity of " *Repelex* " solution will be fed from fountain to rollers. As lever is lowered notch by notch, the feed is reduced accordingly. When control lever is in extreme *down* position, toward front of Duplicator, the feed of " *Repelex* " solution is cut off entirely. When a quick supply of " *Repelex* " is required, turn fountain roller knob clockwise quickly by hand.

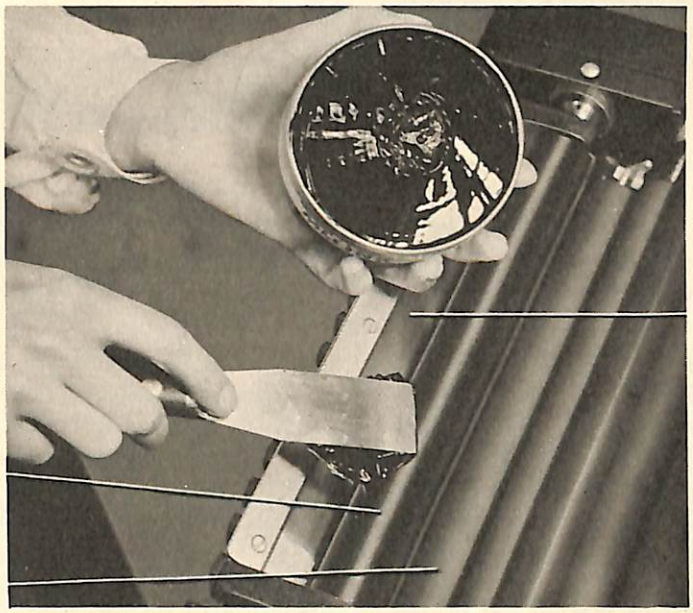
ACTION OF DUCTOR ROLLER . . .

When the contact lever is moved toward fountain, ductor roller is in normal operating position. If it is desired to stop flow of " *Repelex* " solution (without changing setting of ratchet control lever) move contact lever away from fountain.

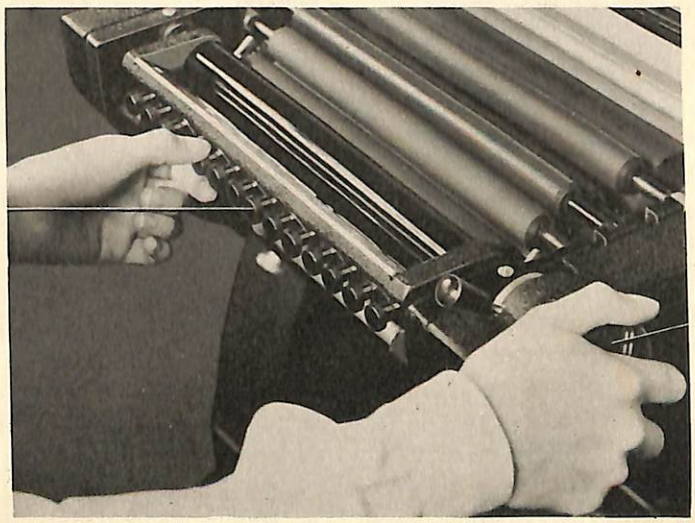
DAMPENING " REPELEX " ROLLERS . . .

To moisten dry " *Repelex* " rollers (after machine has stood idle for a long period) move ductor

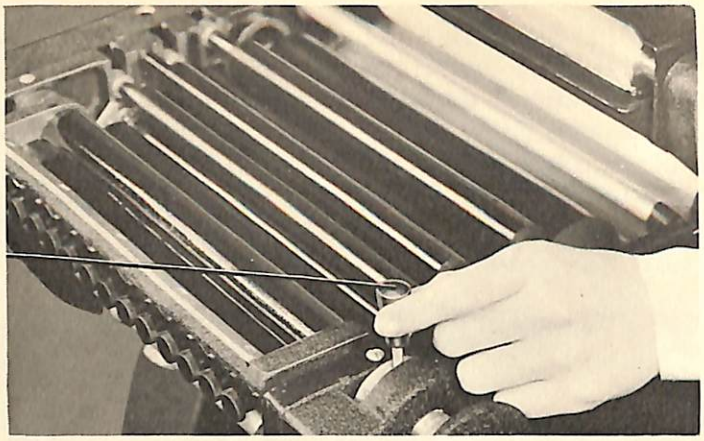
contact lever toward fountain and ratchet control lever to extreme down position and then advance up to 5th or 6th notch. Start machine (not automatic paper-feeder) and allow to run until "*Repelex*" rollers are thoroughly moistened. At this point, stop machine and move ductor contact lever into non-operating position away from fountain. This is advisable so that while putting ink in inking mechanism, the excess "*Repelex*" solution on surface of rollers can be absorbed by the molleton covers.



44—Filling Ink Fountain



45—Adjusting Ink Flow



46—Adjusting Ink Feed

FILLING INK FOUNTAIN . . .

Revolve cylinders with hand-wheel until ink ductor roller is out of contact with fountain roller. Using ink knife, place ink of desired colour and series in fountain. Do not completely fill fountain. More ink can be added at any time, but ink remaining in fountain at end of day must be thrown away.

CAUTION: Before putting ink in fountain, check position of lever on right side of inking mechanism which separates ink form rollers from the oscillating roller. The normal operating position of this lever is pointing toward rear of machine. Also check position of levers on form roller shafts. These levers should point *up* so that form rollers are out of contact with cylinder for duplicating masters.

ADJUSTING INK FLOW . . .

While turning fountain roller knob counter-clockwise by hand adjust ink flow by means of the 14 thumb screws across back of fountain. Turning these screws *in*, forces ink blade against bottom of fountain roller and cuts down the flow of ink. Continue the adjustment until a thin, even film of ink covers the fountain roller from end to end.

CAUTION: Do not open the fountain too wide as excess ink will flow out. It is better to start with a light flow and increase as necessary.

ADJUSTING INK FEED . . .

Ink feed from fountain to rollers is regulated by a 5-position ratchet control lever located at left side of inking mechanism. When ratchet control lever is moved *down* toward rear of Duplicator, ink feed is completely cut off. Raising lever up to first notch causes the fountain roller to revolve. Set control lever in 2nd notch from bottom, start machine (not automatic paper feeder) and allow to run until all ink rollers are covered with a light, even film of ink. Placing ink feed ratchet control lever in 2nd notch permits ink feed to be cut down (by moving control lever down to 1st notch) or increased (by moving control lever up to 3rd or 4th notch) without changing adjustment of screws which regulate ink flow. Now stop machine.

CENTRING ADJUSTABLE CLAMPS . . .

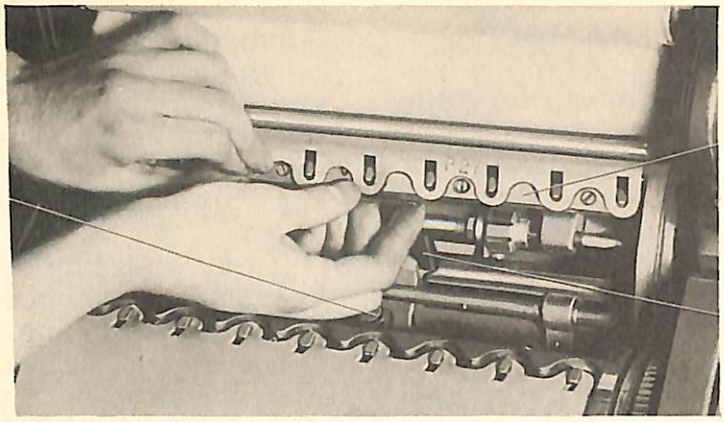
Centre the two adjustable clamps for holding master, from side to side using the notched adjusting screws. Also locate the clamps about $\frac{1}{8}$" from ends of cylinder by loosening lock nuts and turning thumb screws for clamps. (See Illustration No. 53.)

PROVIDING TEST MASTER . . .

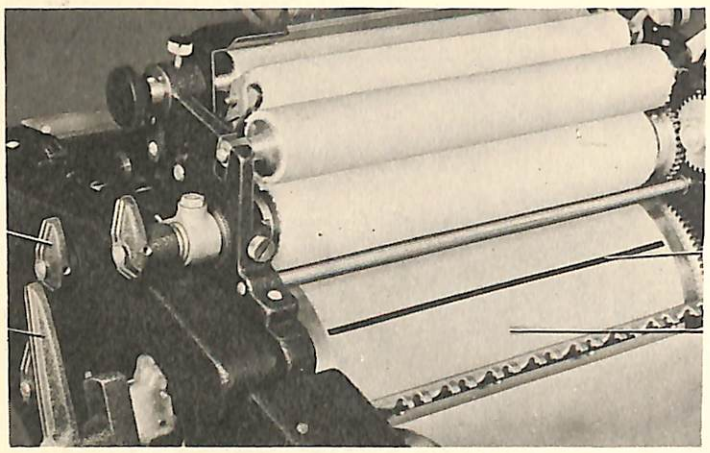
For practice and test purposes, it is suggested that you provide an Aluminium or Zinc master containing a form combining vertical and horizontal rule lines. (Refer to Section Five for instructions on removing "*Keepeze*" and "*Sealinx*" from this master.)

Before attaching Master to the Master Cylinder, bend the serrations of the trailing edge of the Master to 45 degrees—one inch from the end. This will assist in attaching to the Master Cylinder.

47—Attaching Aluminium or Zinc Master to Upper Hooks



48—Attaching Aluminium Zinc Master to Lower Hooks



49—Checking Ink Contact Line on Master from Form Roller

ATTACHING AN ALUMINIUM OR ZINC MASTER . . .

Facing the left side of the Duplicator, revolve cylinders clockwise with handwheel until the row of hooks on upper adjustable clamp is above and clear of the Blanket Cylinder. Grasp the master with right hand at bottom end, with head of image up and slip the loops at the top of master over the hooks of the clamp. (Illustration No. 47.) While keeping the master taut and square with the sides of the cylinder, revolve cylinder with handwheel until the row of hooks on lower adjustable clamp line up with the loops at bottom end of master. Always hold master taut; lift trailing clamp with right hand and with left hand position the loops over the lower hooks. The spring loading of this clamp is sufficient to hold the Master snugly to the cylinder. Apply coating of "*Platex*". (For instructions, see "*Platex*".)

CHECKING ADJUSTMENT OF INK FORM ROLLERS . . .

Start Duplicator. Contact upper and lower ink form rollers to master. Allow machine to make 4 or 5 revolutions. Raise ink form rollers and stop machine. Using handwheel, revolve cylinder until

master is opposite upper and lower form rollers. With cylinder absolutely stationary, contact both form rollers to master and immediately raise them. Revolve cylinder and examine ink contact line from form rollers on surface of master. This line should measure $\frac{1}{8}$" to $\frac{3}{16}$" wide uniformly across master. (If adjustment is necessary, see "Adjusting Ink Form Rollers.")

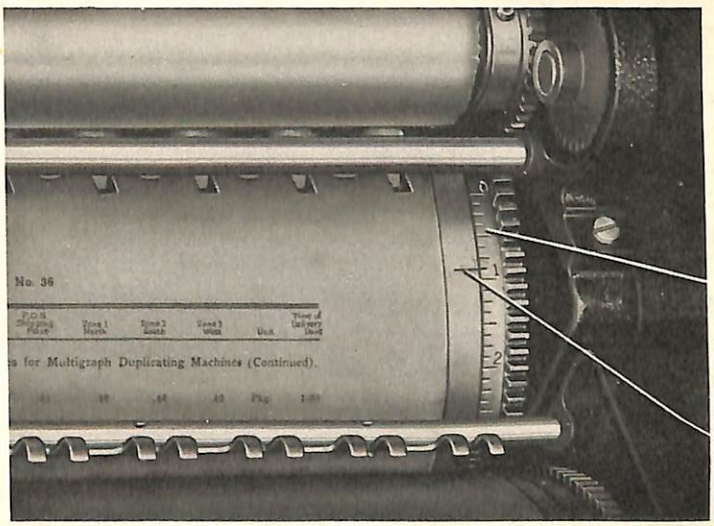
CHECKING ADJUSTMENT OF "REPELEX" FORM ROLLERS . . .

Using handwheel, revolve cylinder until master is opposite "*Repelex*" form roller. With cylinder absolutely stationary, contact form roller to master and immediately raise it. Revolve cylinder and examine "*Repelex*" contact line from form roller on surface of master. This line should measure from $\frac{1}{8}$" to $\frac{3}{16}$" wide, uniformly across master. "*Repelex*" contact line is more difficult to see than ink contact line, but careful sighting across surface of master will make it plainly visible. (If adjustment is necessary, see "Adjusting '*Repelex*' Form Roller.")

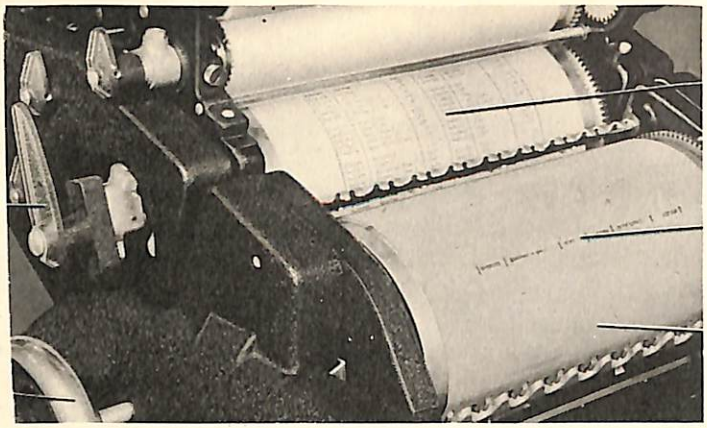
LOCATING IMAGE ON SHEET . . .

Before starting a run, it is necessary to check the position of the cylinder for duplicating master in relation to the blanket cylinder. When properly timed, the openings in the two cylinders should meet as they revolve. Otherwise a complete image may not be transferred to the blanket. Changing the point at which master contacts blanket, changes the location of the image on the sheet.

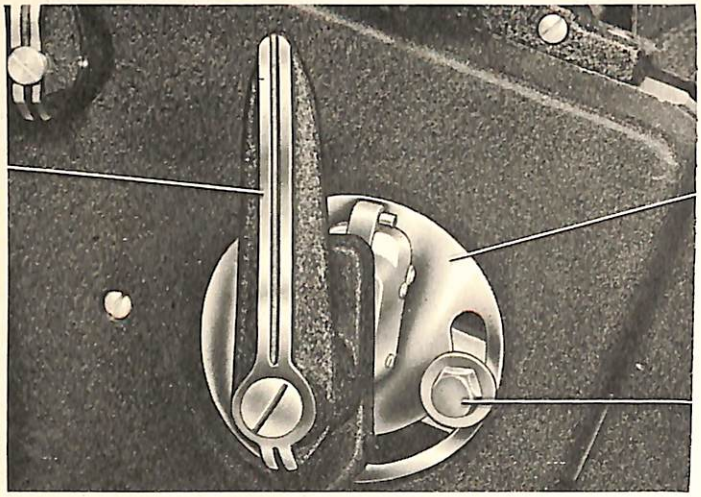
To change the location of the image on the sheet, revolve the cylinder for duplicating master with the handwheel on the right side of the machine until the lower clamp is under the tie-bar of "*Repelex*" mechanism. At this point, a hexagon head bolt should be visible through centre hole in right side plate cover. Loosen hexagon lock bolt with T-wrench, hold the cylinder with left hand, and turn



50—Scale to Indicate Distance Moved



51—Checking Image Contact Line on Blanket from Master



52—Adjusting Pressure Between Master and Blanket

handwheel clockwise to lower image on sheet. Tighten lock bolt. For convenience in gauging distance moved, a scale with $\frac{1}{8}''$ graduations is stamped on the gear. For example, moving this gear up $\frac{1}{2}''$ in relation to the line stamped on the cylinder, will lower the image on the sheet a corresponding distance.

NOTE: It is necessary to clean the blanket after making this adjustment, as it changes the location of the image on the blanket.

CHECKING PRESSURE BETWEEN MASTER AND BLANKET . . .

Clean all contact lines from surface of master with tuft of cotton-wool moistened with "*Repelex*" solution from fountain. Start machine. Contact both ink form rollers for several revolutions. Raise both ink form rollers. Stop machine. Revolve cylinders until image on master is opposite rubber blanket at centre. Bring master into contact with blanket by moving handle for cylinder toward rear of machine until it latches. Do not

move cylinders while making this test. Release handle for cylinder by moving it toward front of machine. Revolve cylinder until image contact line can be seen on surface of blanket. This contact line should measure $\frac{1}{8}$" to $\frac{3}{16}$" wide, uniformly across the blanket.

CAUTION: Always raise ink form rollers out of contact with the master before stopping the machine to avoid leaving streaks of ink across the master.

ADJUSTING PRESSURE BETWEEN MASTER AND BLANKET . . .

After checking pressure as above, if adjustment is necessary, loosen hexagon screw lock for disc. Rotate disc counter-clockwise to increase contact pressure. Fasten adjusting disc firmly with hexagon lock screw after making adjustment.

CHECKING PRESSURE BETWEEN BLANKET AND IMPRESSION CYLINDERS . . .

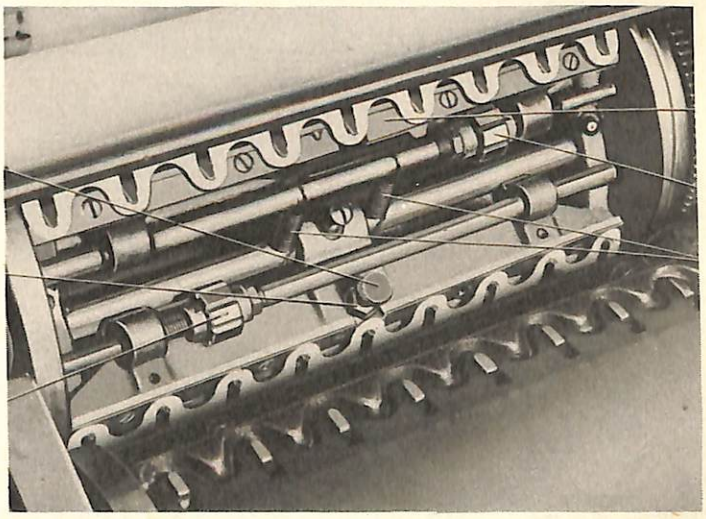
Wash blanket with rag and *Blanket Wash.* Set ductor contact lever in operating position. Set "*Repelex*" ratchet control lever in 2nd or 3rd notch from bottom. Set ink control rachet lever in 2nd notch from bottom. Start machine Contact "*Repelex*" form roller to master. Contact upper and lower ink form rollers to master. Start automatic paper feeder. Contact master to blanket. Run 3 or 4 copies and stop machine by *reversing all above instructions in proper sequence.*

WHEN TO INCREASE CYLINDER PRESSURES . . .

At this point, examine imprint on sheet and see that every part of impression is perfect. Check master to see that entire image is picking up ink. Also check blanket to see that entire inked image is transferring to blanket.

(a) If image on master is not completely inked, more contact pressure is needed between ink form rollers and master.

(b) If image on master is completely inked, but transfer on blanket is indistinct with many



53—Adjustable Clamp for Squaring Image

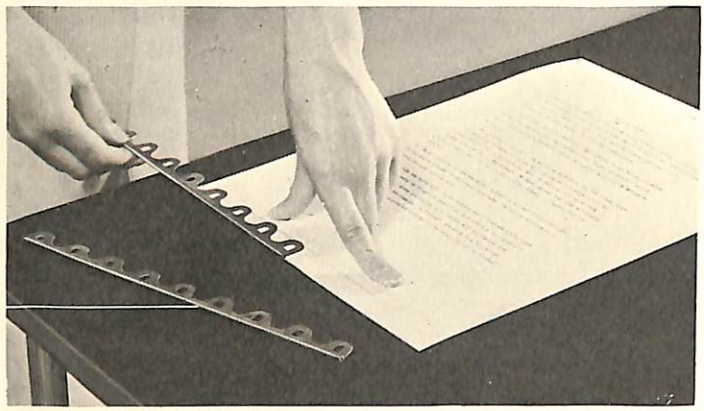
broken lines and characters throughout, more contact pressure is needed between master and blanket.

(c) If image on master is completely inked, and transfer on blanket is perfect, but impression on sheet is indistinct with many broken lines and characters throughout, more contact pressure is needed between impression and blanket cylinders.

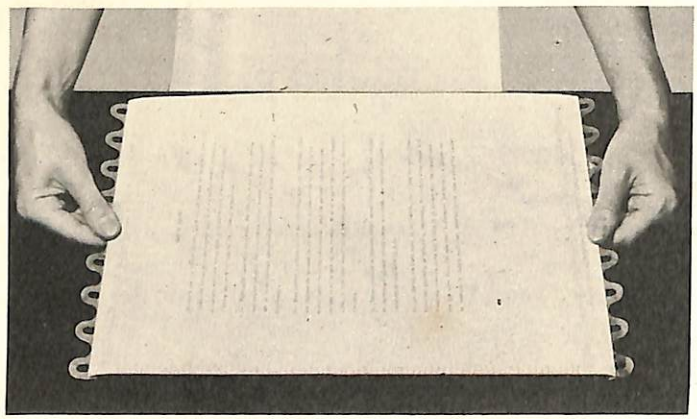
(If a change in the pressure between impression and blanket cylinders is necessary, see instructions under "Adjusting Pressure Between Impression and Blanket Cylinders.")

SQUARING IMAGE ON SHEET . . .

The clamps by which the master is attached to the cylinder are adjustable from side to side. If the image has not been placed squarely on the master, turn top notched adjusting screw so as to swing top of image on master in the same direction it is desired to move top of image on sheet. Turn bottom notched adjusting screw in opposite direction. It is advisable to move each adjusting screw half the distance necessary to square image on sheet. (See Illustration No. 53.)



54—Attaching Adapter to "DupliMAT"



55—Turning Adapters Outward

ATTACHING "DUPLIMAT" MASTER . . .

For you convenience, " DupliMAT" Masters are made with die cut serrated ends as well as square cut ends to be used with metal adapters. Where maximum length of run is required, the metal adapters are recommended. To attach adapters to " DupliMAT," lay prepared " DupliMAT " on a clean flat surface, image side up. Slide one adapter on one end of the " DupliMAT," with the serrated edge of the adapter on top facing inward. In like manner, slide the second adapter into place on the opposite end. Next, turn the serrated edges of the adapters outward, holding the " DupliMAT " taut. This folds the ends of the " DupliMAT " and holds it securely in the adapter.

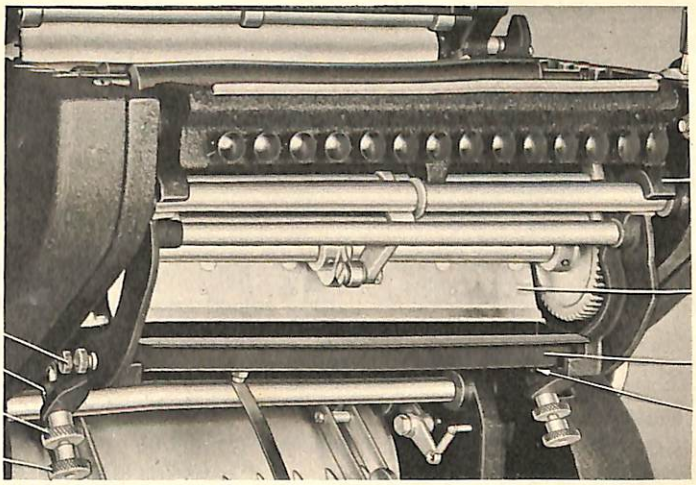
After adapters have been attached, all other instructions for attaching " DupliMAT " to cylinder are the same as for attaching metal masters. (See " Attaching Aluminium or Zinc Duplicating Masters.")

ROLLER CLEANING DEVICE . . .

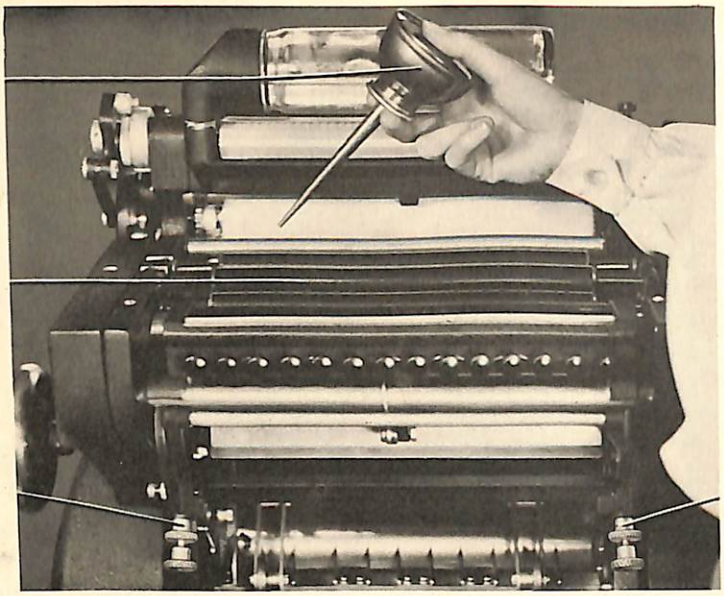
The ink rollers must be cleaned at the end of each day's operation. They must also be cleaned thoroughly when changing from one colour of ink to another. To speed this operation, without removing rollers from inking mechanism, a roller cleaning device is provided.

ATTACHING ROLLER CLEANER . . .

Place the U-openings in the ends of the arms over the rear tie-bar of the inking mechanism and swing cleaner forward and up into position under the ink rollers. Loosen lock nuts and adjusting nuts so the cross-pins in the hook screws clear the slots in the castings. Turn the hook screws until the hooks rest on the flanges of the inking mechanism side plates. Tighten the lower lock nuts (while gradually tightening the upper adjusting nuts) until they bind on the ends of the hook screws. DO NOT TIGHTEN THE ADJUSTING NUTS COMPLETELY UNTIL READY TO USE



56—Roller Cleaning Device



57—Cleaning Inking Rollers

THE CLEANING DEVICE, AS WIPER BLADE MUST NOT SCRAPE ON OSCILLATING ROLLER DURING NORMAL OPERATION.

CLEANING INK ROLLERS . . .

The duplicating master must be coated with "*Keepeze*" to protect the image, as instructed. Move ratchet control lever for ink feed to "off" position. Start the Duplicator. Tighten the upper knurled adjusting nuts on the right and left hook screws until the rubber wiper blade of the roller cleaner contacts the oscillating roller with a firm pressure. Fill a *clean* oil can with *Blanket Wash*. Starting at one end of the distribution rollers, slowly pour *Blanket Wash* over a section of the rollers, gradually moving toward the other end. As the ink is thinned, it will be squeegeed from the oscillating roller into the trough of the roller cleaner. Continue to apply *Blanket Wash* slowly to a small section of the rollers at a time until they are squeegeed clean.

CAUTION: Always use *Blanket Wash* in the roller cleaning device. Do not use naphtha, benzine, petrol, kerosene, or any other inflammable solvent, as the friction developed while the roller cleaner is in use will create a fire hazard.

NORMAL POSITION OF ROLLER CLEANER . . .

When rollers are clean, and *before stopping machine*, loosen the upper knurled adjusting nuts until they bind on lower lock nuts. In this position, the rubber wiper blade must be out of contact with the oscillating roller. The roller cleaning device may be left in this position while the Duplicator is in normal operation. Stop machine.

CLEANING INK FOUNTAIN...

Remove ductor roller from inking mechanism, and check for cleanliness. If additional cleaning is necessary, wipe with a rag dampened with *Blanket Wash.* With the ink knife, remove ink remaining in fountain. Detach ink fountain by tipping it up and lifting it from the fountain roller. Finish cleaning the fountain with a rag dampened with *Blanket Wash.* Now clean fountain roller thoroughly, particularly the ends where the fountain casting fits.

CLEANING ROLLER CLEANER...

The roller cleaning device should be removed from the machine at least once a week for thorough cleaning. The trough can be removed for cleaning by loosening the jam screw at right end. The rubber squeegee blade should be wiped off after each use to prevent ink drying on the wiping edge.

OPERATING SUGGESTIONS

FOR

"MULTILITH" DUPLICATOR

MODEL 1250

Here is a quick check-up on some conditions which may develop through careless operation. Corrective procedures are listed.

1—What causes master to "tone" in one continuous streak from top to bottom?

(a) Not enough "*Repelex*" form roller contact pressure against master

(b) Low spot in "*Repelex*" form roller core.

(c) Too much ink flowing at this point.

(d) Coating of ink on "*Repelex*" form roller.

2—What causes master to "tone" all over faintly, especially when using coloured inks, and when surface appears moist?

(a) Body of ink too thin.

(b) Too much ink form roller contact pressure against master.

3—What causes master to "tone" from side to side in streaks evenly spaced?

(a) Ink form rollers too tight on their shafts.

(b) Some roller in the inking mechanism binding and causing form rollers to bind.

(c) "*Repelex*" form roller too tight on its shaft.

(d) Teeth of driving gears badly worn.

4—What causes master to "tone" from side to side in streaks in different places each revolution?

(a) End play of ink form rollers on their shafts.

5—What causes master to "tone" when running light copy and with excessive "*Repelex*" being used?

(a) Too much "*Repelex*" form roller contact pressure, so that "*Repelex*" is actually squeezed out ahead of the roller leaving the master dry.

6—What causes characters on master to fill up and broaden out?

(a) Master is oxidized at these spots because it was not properly protected by "*Keepeze*" over night or when stored.

(b) Master dried out on machine because it was allowed to stand too long without being protected with "*Keepeze.*"

7—What causes ink to "feather out" on the master from the rear of the image especially following a solid area?

(a) Form area larger than recommended.

(b) Too much ink being fed to master.

(c) Body of ink too thin.

(d) Too much ink form roller contact pressure especially when using MLS series ink.

8—What causes image to have a spongy, mottled appearance?

(a) Ink form roller contact pressure too light.

(b) Master to blanket contact pressure too light.

(c) Impression cylinder to blanket contact pressure too light.

9—What is the effect of an image "breaking down"?

(a) An image "breaks down" when the sensitizer foundation disintegrates and disappears from the master. The only solution is a new photographic master, and then to strengthen the image every few thousand impressions with applications of "*Sealinx*."

10—What is the effect of an image "glazing over"? (Zinc Master).

(a) An image is "glazed over" when it appears to be perfect on the master but will not accept ink from the ink form rollers. Close examination will show slick, dry spots that have lost their ink-attractiveness and consequently are not picking up a film of ink. One solution is as follows:

Saturate two wads of cotton, one with GREEN "*Platex*" and one with undiluted liquid Plate Cleaner. Rub glazed portion of image and some of the surrounding area thoroughly with Green "*Platex*." Next, rub glazed portion of image lightly with liquid Plate Cleaner until ink from other portions of image begins to adhere to glazed portion. Then go over entire master thoroughly with Green "*Platex*" to assure removal of all Plate Cleaner. If this is not done, Plate Cleaner left on master will pick up ink. Contact ink form rollers and proceed with run.

11—How can a great number of apparently low spots in a blanket be corrected?

(a) Check master to blanket contact pressure. The line of contact should measure $\frac{1}{8}$" to $\frac{3}{16}$" wide. (See "Checking and Adjusting Pressure Between Master and Blanket.")

12—What should be done when a blanket swells during a run?

(a) Blanket should be removed from the machine, washed thoroughly with *Blanket Wash*, dusted with *Blankdust* and allowed to rest several weeks. It is advisable to keep several blankets in alternate use.

13—What can be done to temporarily restore a low spot in a blanket without removing it from the machine?

(a) Hold a cloth saturated with *Blanket Wash* over the low spot for one or two minutes. This will swell the rubber.

14—What can be done to correct a known low spot in a blanket?

(a) Most low spots can be corrected by careful underlaying with discs of thin tissue. Tear a small disc of tissue and paste it on

the back of the blanket in the centre of the low spot. Paste over this successively larger discs of tissue until the entire low spot is covered and built up to height of surrounding area.

15—What is the effect of a loose blanket?

(a) A faint double or second impression will appear on the sheet. Blanket should always be tight to the surface of the cylinder.

16—What is the effect on a blanket of running small sizes of thick stock?

(a) Such stock will damage the blanket by causing permanent indentations or low areas of the size of the stock being run. Always release impression cylinder to blanket contact pressure and put on an old blanket when running jobs on thick card stock and envelopes.

17—What causes a "ghost" impression to appear approximately 6″ below main impression on sheet?

(a) Too much "*Repelex*" form roller pressure.

(b) "*Repelex*" form roller too dry.

18—What are causes of paper of average weight not feeding properly?

(a) Paper not sufficiently "fanned" before loading into magazine.

(b) Top of pile too low.

(c) Vacuum to suction foot too weak.

(d) Air blowers not fluttering top sheets.

(e) Paper height control bar too close to suction foot.

19—What are the causes of card stock not feeding properly?

(a) Check all causes under No. 18.

(b) Failure to remove sheet separator.

20—What causes variation in vertical register when feeding paper of average weight?

(a) Cam band out of adjustment.

(b) Left jogger guide on conveyor board binding sheet against right guide.

21—What causes variation in vertical register when feeding card stock?

(a) Cam band out of adjustment.

(b) Stiff, heavy stock sometimes strikes paper stop fingers and bounces away. Use of sheet rider will correct this condition.

22—What is the cause of a "buckle" in sheet between pullout rollers and conveyor rollers?

(a) Rear conveyor rollers should always ride on the carrier tapes so that speed of sheet travel is not changed.

QUICK REFERENCE CHARTS FOR HANDLING

"MULTILITH" DUPLICATING MASTERS

STEPS IN PREPARING "DUPLIMAT" FOR OPERATION

1—Apply image
2—Attach adapters
3—Attach master to cylinder
4—Coat with GREEN "*Platex*"
5—Start machine
6—Contact ink form rollers
7—Contact "*Repelex*" form roller
8—Start paper feeder
9—Contact master to blanket
10—Duplicate copies

STEPS IN PREPARING ALUMINIUM MASTERS (DIRECT IMAGE) FOR OPERATION

1—Apply image
2—Attach master to cylinder
3—Coat with BROWN "*Platex*"
4—Start machine
5—Contact ink form rollers
6—Contact "*Repelex*" form roller
7—Start paper feeder
8—Contact master to blanket
9—Duplicate copies

STEPS TO STORE ALUMINIUM MASTERS (DIRECT IMAGE) FOR RE-USE

1—With ink and "*Repelex*" form rollers out of contact with master, but with master in contact with blanket, remove excess ink by running 4 sheets through Duplicator
2—Clean master with "*Repelex*" solution from fountain
3—Remove master from cylinder
4—Wash master thoroughly with water-soaked cotton-wool, preferably under running water
5—Dry with hot air drier
6—Apply "*Keepeze*" thoroughly to entire surface of master and dry
7—Apply "*Sealinx*"
8—Store for future use

STEPS IN PREPARING ALUMINIUM OR ZINC MASTERS (PHOTOGRAPHIC IMAGE) FOR OPERATION

1—Wash master thoroughly with water-soaked cotton-wool (preferably under running water).
2—Dry with hot air drier
3—Attach master to cylinder
4—Coat with GREEN "*Platex*"
5—Start machine
6—Contact ink form rollers
7—Contact "*Repelex*" form rollers
8—Start paper feeder
9—Contact master to blanket
10—Duplicate copies

STEPS TO STORE ALUMINIUM OR ZINC MASTERS (PHOTOGRAPHIC IMAGE) FOR RE-USE

1—Remove master from cylinder
2—Clean master with "*Keepeze*" applied to tuft of wet cotton-wool
3—Wash master thoroughly with water soaked cotton-wool (preferably under running water)
4—Dry with hot air drier
5—Apply 2nd coating of "*Keepeze*" thoroughly using tuft of clean, dry cotton-wool
6—Apply thin, even film of "*Sealinx*" to master
7—Store for future use

STEPS IN RE-RUNNING STORED ALUMINIUM OR ZINC MASTERS

1—Wash master thoroughly with water-soaked cotton-wool (preferably under running water)
2—Dry with hot air drier
3—Attach master to cylinder
(Proceed as instructed for either Aluminium or Zinc Masters)

LUBRICATION

All important bearing points are provided with grease-packed needle bearings, ball bearings, or oil-less bearings. These prepacked bearings should be re-packed every three months.

All oil holes should be supplied with one drop of oil daily. Remove surplus oil with cloth.

The visible oil reservoir on vacuum pump should be kept full.

The bearings of ink and "*Repelex*" form rollers, mounted on shafts, should be greased once a week.

Use "Multigraph" Oil and Grease especially prepared for your "MULTILITH" DUPLICATOR.

To ensure proper oiling and greasing, take advantage of the convenient Maintenance Service Agreement.

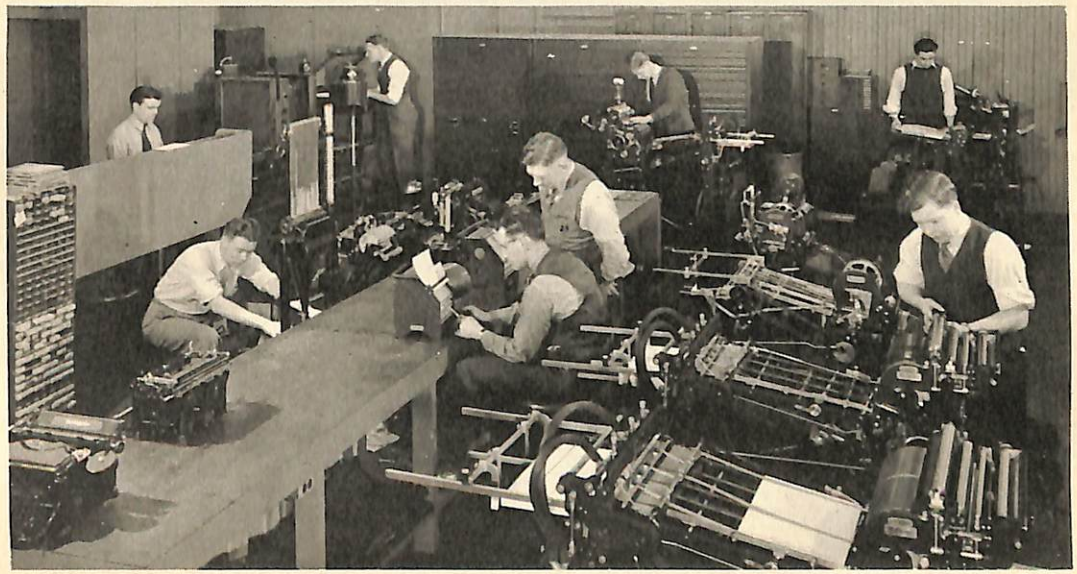
INSPECTION AND MECHANICAL SERVICE

Any machine which has moving parts necessarily requires service from time to time. Your "MULTILITH" DUPLICATOR is no exception and by getting this service when the need arises, you will prolong the life of your equipment and be assured of its continued satisfactory service.

SERVICE can be obtained from your "Multigraph" Branch. You will find this SERVICE as performed by A-M Servicemen to be thoroughly dependable.

Every A-M Serviceman has had intensive training under the supervision of the Mechanical Service Division of Addressograph-Multigraph Limited. This training equips the Serviceman with a thorough knowledge of all "Multigraph" Products, their functions, and uses. Through actual work, closely supervised, these men have learned to service "Multigraph" Products correctly and efficiently.

Additional training of A-M Servicemen, goes on constantly in their local Branches under the direction of the Mechanical Service Division.



If your "MULTILITH" DUPLICATOR is under a periodic Maintenance Service Agreement, the Serviceman, when making these inspections, will call your attention to any needed service work.

Maintenance Service Agreements are available from your local "Multigraph" Branch. Under the Agreement your "MULTILITH" DUPLICATOR will be completely inspected periodically by an A-M Serviceman. He will clean, lubricate, and adjust your equipment.

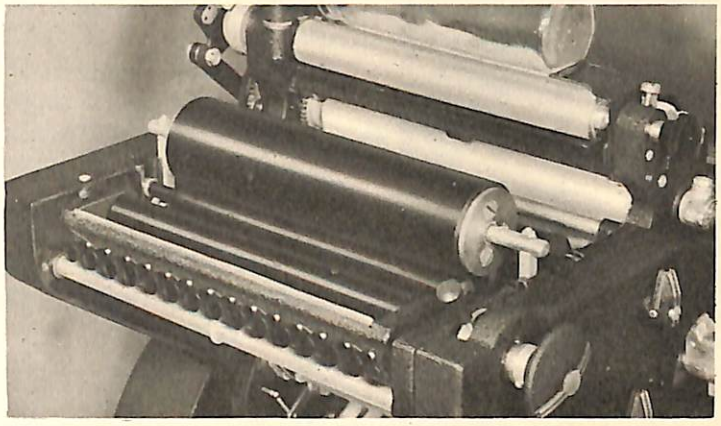
Should you desire instructions or information pertaining to Equipment, Accessories, or Supplies, the A-M Serviceman will gladly help you when he makes the inspection.

Emergency repairs or special service can always be obtained should you need them between inspection periods.

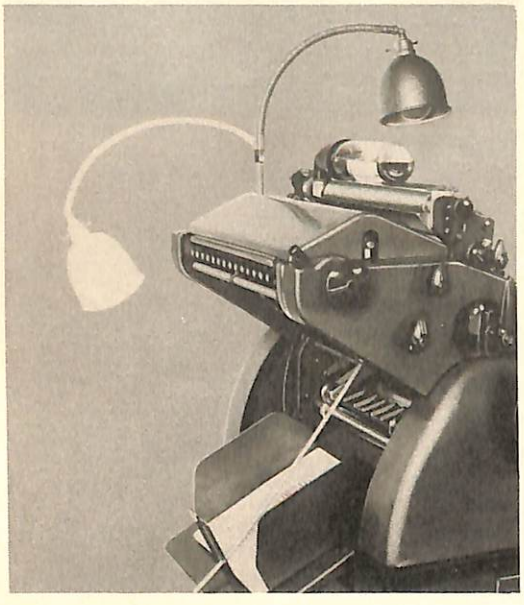
The small charge made for periodic Inspection Service will be more than repaid in continued, satisfactory performance of your MULTILITH DUPLICATOR throughout its life.

TIME-SAVING AUXILIARY FEATURES

OSCILLATING ROLLER



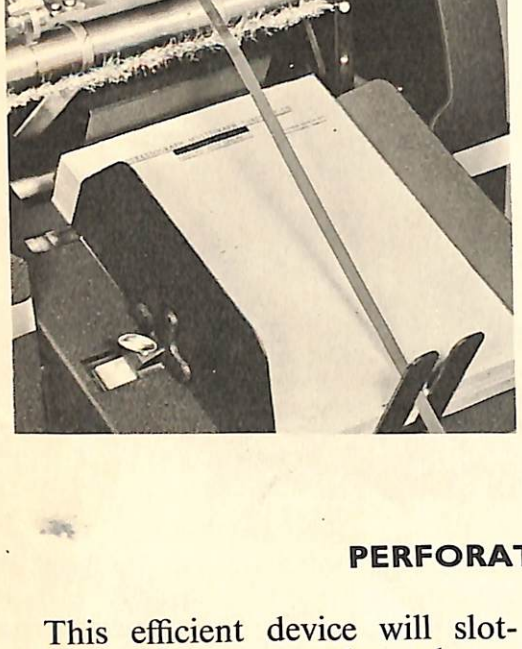
For jobs requiring heavy coverage of ink, a large - diameter oscillating roller is added to the standard inking mechanism. This self-actuating oscillator, substituted for the regular top idler roller, acts as a reservoir for an increased volume of ink to be carried to the form rollers. The reproduction of halftones and solid areas is improved by the addition of this oscillator.



LIGHT FIXTURE

Illumination wherever operator needs it—either at the feeding or delivery end of the "Multilith" Duplicator—is provided by this attractive light fixture. It is conveniently mounted on a flexible arm and has a tilting metal reflector. Its installation is good insurance for high quality duplicating even on dark days.

MECHANICAL JOGGER



This device saves time and money by doing automatically work that would otherwise need to be done by hand. The all-metal mechanical jogger smoothly and quietly stacks duplicated copies evenly in the form receiver, making them ready for a second run, folding, or padding. Spoilage caused by excessive handling of duplicated copies is eliminated. Forms from 3″ × 5″ up to $9\frac{3}{4}$″ × 14″ can be jogged. Capacity is 1,000 sheets of 21-pound stock or the equivalent in other weights.

PERFORATING DEVICE

This efficient device will slot-perforate forms to make stubs on such jobs as voucher cheques and receipts. Perforating is done simultaneously with the duplicating, parallel with the direction of sheet feed. From one to three perforating wheels can be used at a time. Slitting or scoring operations can also be performed with this device.

GUARANTEE

Addressograph-Multigraph Limited guarantees for one year after date of despatch, all equipment it sells through their established Branches, to be free from defects in materials and workmanship. It is understood that Addressograph - Multigraph Limited will not be responsible for conditions resulting from repairs and replacements made by, or supplies used which are purchased from, other than representatives of Addressograph-Multigraph Limited.

" Multigraph," " DupliMAT," " Duro-clear," " Platex," " Repelex," " Multilith," " Keepeze," and are registered Trade Marks of Addressograph-Multigraph Limited.

MEMORANDA

MEMORANDA

MEMORANDA

ROLLERS ELEVATOR 200 – 308

BUSHING " 200 – 309

We recommend that your investment in your " Multilith " Duplicator be safeguarded by a Maintenance Service contract. Ask your " Multilith " representative for details. The following parts are listed for your convenience when ordering replacement material. Please order by part number and description to avoid errors.

PRESTON ~~3767~~ ~~57919~~ 52944

INK ROLLERS

200-600A	Form Roller (2)
296-1644A	Ductor Roller
296-1648A	Intermediate Distribution Roller (3)
296-1650A1	Upper Distribution Roller
120-2200A	Auxiliary Vibrator Roller

" REPELEX " ATTACHMENT

296-1712A1	Ductor Roller
296-1714A	Linen Cover for Ductor Roller
296-1719A	Linen Cover for Rider Roller
296-1720A1	" Repelex " Form Roller
296-1722A	Molleton Cover for " Repelex " Form Roller
120-366	Bottle Cap
120-3660	" Repelex " Bottle
120-3661	Gasket for Cap
120-3665A	Valve for Bottle
120-3668	Gasket for Valve
120-365A	CONTROL KNOB

VACUUM FEEDER

120-404	Left Paper Guide
120-405	Right Paper Guide
120-406	Back Paper Guide
OG-670	Spring for Conveyor Rolls (4)
120-1325A	Lock Clip for Upper Feed Roller Adjusting Nuts (2)
120-4033	Sheet Separator Clip
120-4043	Thumb Screw for Paper Guides and Stops (3)
120-4045	Rubber Tip for Support Bars (2)
D3-5225	Spring Clip for Micrometer Unit

ACCESSORIES

MA-49	$\frac{9}{16}$" × $\frac{5}{8}$" Wrench
MA-53	Oil Can
MA-54	Screwdriver
MA-60	$\frac{1}{4}$" Allen Set Screw Wrench
MA-70	$\frac{5}{16}$" Allen Set Screw Wrench
A-94	Wrench
A-95	Wrench
MA-547	Cover for Duplicator
MA-185	Paper Feed Wrench
57-250A	Tinsel
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